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SIMULATOR REQUIREMENTS ANALYSIS FOR THE VIRTUAL BRIGADE TRAINING PROGRAM

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Larry Mengel, *Task Leader*

Don Appler
Arthur Junot
Julia A. Loughran
D. Robert Worley

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INSTITUTE FOR DEFENSE ANALYSES
1801 N. Beauregard Street, Alexandria, Virginia 22311-1772

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PREFACE

The Virtual Brigade Training Program is a congressionally directed effort, funded through the Advanced Research Projects Agency (ARPA), and conducted at the U S Army's Armor Center at Ft Knox, Kentucky The Institute for Defense Analyses (IDA) effort producing this report is the result of a Quick Look Team This report, following several briefings, constitutes fulfillment of the Virtual Brigade portion of the ARPA Assignment A-132, Advanced Distributed Simulation Technology

INTRODUCTION

In November 1993 the Advanced Research Projects Agency (ARPA) tasked the Institute for Defense Analyses (IDA) to conduct a quick analysis of the functional requirements for the Army's Virtual Brigade Training Program (VBTP). The urgency of this effort was based on the imminent expiration of a low cost option to buy computer image generators from the Close Combat Tactical Trainer (CCTT) contractor. ARPA and the Army needed a better understanding of VBTP requirements to make an informed decision about this option. The Quick Look Team (QLT) was assembled to conduct this analysis. The team consisted of:

BG (Ret.) Arthur Junot, Combat Service Support Training Specialist. He was instrumental in the development of Simulation Networking (SIMNET). He is currently the Executive Director of the 1st Cavalry Division Association at Ft. Hood, TX.

COL (Ret.) Larry Mengel, Team Leader. He was formally the Army's TRADOC Systems Manager (TSM) for the Combined Arms Tactical Trainer (CATT). He is currently working as a consultant to IDA.

COL (Ret.) Donald Appler, Training Specialist. He was formally the Director of Training and Development at the Armor School at Ft. Knox, KY. He is currently serving as a consultant to IDA.

Dr. Robert Worley, Technology Specialist. He is currently a research staff member in the Computer and Software Engineering Division of IDA.

Ms. Julia Loughran, Technology Specialist. She is currently a research staff member in the Computer and Software Engineering Division of IDA.

The QLT was established to work concurrently and in cooperation with the Ft. Knox Program Action Teams (PAT) that have the mission of determining the VBTP functional requirements. The products of the QLT would be preliminary, and would be greatly expanded by the Ft. Knox PATs.

The task assigned to the QLT was to develop the preliminary functional requirements analysis for the VBTP. At the time of this tasking, however, the VBTP was an evolving concept with a variety of interpretations. It was necessary to take a broad view of the task and develop some of the fundamental assumptions upon which the VBTP could be built.

The first of these was a conceptual macro training strategy including not just maneuver but also Combat Support (CS) and Combat Service Support (CSS). Second, the organization of the 194th Armor Brigade, the unit that will be the first to use this concept, is very much in flux. It was necessary to assume a target Table of Organization and Equipment (TO&E). Third, there was no dominant concept for the architecture of the program. The QLT had to develop a conceptual architecture upon which to base its analysis. These assumptions and the analysis developed from them will serve as a solid start point for the Ft. Knox PATs.

The Virtual Brigade is a training environment, not a brigade. It is a training environment that maximizes the use of Training Aids, Devices, Simulators and Simulations (TADSS). It is an environment where a brigade can train all of its subordinate units either singly or together. Recognizing the severe limits on field training, the fundamental question becomes: *What is the best mix of TADSS and field training?*

The VBTP is a demonstration of the Virtual Brigade concept applied to the very real-world problem of preparing the 194th Separate Armored Brigade at Ft. Knox for its National Training Center (NTC) rotation in May 1996. Given these parameters, the question of the proper mix of training resources must be constrained to those that are currently available to the brigade and those that might reasonably be made available to them in the interim.

METHODOLOGY

The QLT process is as follows.

1. Develop a macro training strategy describing how the brigade might use its training time and resources.
2. Build a database representing the projected brigade TO&E.
3. Map together the training strategy and TO&E to determine requirements for number and types of simulators.
4. Canvass industry to determine what technologies would be available to support the training requirements.
5. Develop facilities concept to guide and constrain the selection of technical solutions to the requirements.
6. Map together the above to form recommendations about what should be done to create the Virtual Brigade.
7. Outline the steps to complete the Virtual Brigade in time to prepare the 194th Brigade for its May 1996 rotation.

FINDINGS

Seven representative Virtual Training Exercises (VTXs) were constructed, and the representation of each vehicle in the exercise was determined. This process was repeated for each exercise and the results tallied to determine the upper limit of simulators, semi-automated forces, and automated forces.

The VTXs considered are:

1. Armored Heavy Task Force with brigade slice in the attack.
2. Armored Heavy Task Force with brigade slice in a movement to contact.
3. Armored Heavy Task Force with brigade slice in the defense.
4. Brigade Command Field Exercise manned down to company commander level.
5. Mechanized Infantry Heavy Task Force with brigade slice in the attack.
6. Mechanized Infantry Heavy Task Force with brigade slice in the movement to contact.
7. Mechanized Infantry Heavy Task Force with brigade slice in the defense.

There are four alternative vehicle representations. To determine the most cost-effective representation of a battlefield vehicle commensurate with the training mission, it was necessary to identify the alternatives and criteria for selecting between the alternatives.

Alternative vehicle representations differ in degree of reconfigurability and fidelity. Reconfigurability means simply that a simulator can be changed from a representation of one type of vehicle to another. There are two relevant aspects of reconfigurability. First is the *ease* with which a change can be made. Reconfiguration ease could range from a simple software switch to physical reconstruction taking days or months. *Span* of reconfiguration deals with the number of different kinds of vehicles that a single simulator can support, ranging from a single vehicle, to all wheeled vehicles, to all ground vehicles.

Closely associated with these concepts are the attributes of fidelity. There are three fidelity attributes—Image, Form & Fit, and Behavior. *Image fidelity* refers to the view of the virtual world as seen from the simulator. *Form & fit fidelity*, or cab fidelity, is a function of the man-machine interface of the simulator. *Behavioral fidelity* refers to the way the simulated entity performs in the virtual world; this has little to do with the hardware of the simulator, but a lot to do with its software.

The alternative representations are cab replicas, reconfigurable workstations, semi-automated forces, and automated forces.

The replicab is a high form & fit fidelity simulator. It supports the interactions of a crew that fights the vehicle on the battlefield. It has the right switches, knobs, and dials to force the crew to perform the same ergonomic functions they would have to perform on their actual vehicle. Replicabs might be reconfigurable to a few different vehicle variations, but the reconfiguration process is measured in hours because hardware must be changed.

A reconfigurable pod is a workstation that provides an out-the-window view of the virtual battlefield but having no form & fit fidelity. Because it does not have specific controls and dimensions, it can be reconfigured in software instead of hardware in a matter of minutes or seconds. A reconfigurable pod provides an operator with dynamic presence on the battlefield and with oral communication with other command and control entities. A pod is a low-cost-per-seat simulator.

Semi-automated forces (SAF) are software-driven entities managed from a workstation that controls many entities. They are maneuvered and operated by software that determines what they should do and when they should do it. The operator at the workstation can allow them to continue autonomously or can intervene whenever necessary to do something other than what the software would determine.

Automated forces are a class of simulations that have been adapted to operate on the virtual battlefield. The capability is being developed for both Brigade/Battalion Battle Simulation (BBS) and JANUS simulations to control SIMNET SAF entities in lieu of a SAF operator. Work on both of these models could be accelerated.

Five vehicle representation criteria were defined.

1. **Dynamic Presence.** If the vehicle needs to see, be seen, traverse, and be vulnerable on the battlefield, then it should at least be represented as an automated force entity.
2. **Dynamic Presence with Positive Control over Entities.** If the vehicle requires dynamic presence, but the commander wants direct control over how it operates, then it is represented as a SAF entity.
3. **Radio Presence.** If the vehicle meets both of the above conditions, and it is an active participant in the communications networks of the brigade, then it is represented by, at least, a soldier-operated pod.
4. **Crew Dynamics.** If the vehicle's role in the battle depends on the crew's interactions (i.e., the crew fights the vehicle), then the vehicle is represented by a replicab.
5. **Intermittent Use.** Vehicles represented as pods or replicabs that are frequently idle should be shared over time.

European SIMNET simulators can be reconfigured. They have been reconfigured in the past. The replicabs could be converted into reconfigurable simulators with a span of two or three. Switching configurations would probably take on the order of an hour. The more challenging aspect of rebuilding these simulators is defining the functionality of the new configurations and writing the associated software.

The brigade can either buy Computer Image Generators (CIG) or buy finished simulators. CIGs can be purchased from a manufacturer and configured (including software) by a third party into a complete simulator. Or a finished simulator (with CIG embedded) can be purchased from a systems house. In buying directly from a manufacturer, the only CIG that could generate significant discount buy advantages is the ESIG 2000 which is being used on both the CCTT and GUARDFIST programs. However, systems houses buy CIGs in sufficient quantity to generate significant discounts. Buying a finished simulator from a large system house generates the advantages of discount buying and turnkey operations.

The NTC rotation schedule drives the decision. The 194th Brigade needs to start training about 10 months before its NTC rotation in May 1996. An operational training capability is needed, therefore, by August 1995. Given this schedule, the ability to develop the simulation quickly becomes very important which gives weight to the GT200. If the NTC rotation were to be delayed a year or so, compatibility with CCTT becomes a more important driver in the equation and the ESIG 2000 gets more weight.

RECOMMENDATIONS

Recommended Simulator Mix

- The 14 simulators returning from Europe should be rebuilt as M113s with reconfigurability to M901.
- Build new FIST-V and COLT replicabs.
- Build 42 new M2/M3 Bradley replicabs, half with reconfigurability to M1A1 and M1A2.
- Build 11 new reconfigurable M1A1/M1A2 replicabs.
- Update M1 tank simulators to M1A1 configuration.
- Build 75 new generic pods with reconfigurability to the entire range of platforms. Send 14 pods to Reserve and National Guard units.
- Blue SAF should be capable of generating up to 232 vehicles. Given current technology, that implies at least 5 Blue SAF work stations (preferably ModSAF).
- Obtain two BBS-SIMNET suites playing Red. The training brigade needs to be able to fight against a Red Division. The evolving BBS-SIMNET interface (under contract from NRaD) could be very useful here.
- Build five Dismounted Infantry SAF (SAFDI) suites, each capable of managing 11 squads of dismounted infantry. We see a requirement for 52 infantry squads that can be dismounted from the Bradleys and M113s. The SAFDI capability developed by University of Central Florida is owned by the government and is available to fill this role. It should be installed as soon as possible.

Facility Recommendations

Take maximum advantage of the current SIMNET capability. The current SIMNET capability represents a very credible trainer. Part of Virtual Brigade's success will derive from taking maximum advantage of the current capability.

Build portable digital technology components. We propose a portable "the digital shopping cart" that can be stationed next to a replicab or pod and connected to bring in the functionality of the appropriate digital battlefield technology.

Begin immediately to double facility floor space. We envision construction of an addition that approximately doubles the floor space of the two existing facilities. The approval, contracting, and construction processes are lengthy and must be started as quickly as possible. It is unlikely that the building will be completed in time to meet the 194th's training schedule.

Establish an alternate facility at Ft. Knox in an existing building. An existing facility to house Virtual Brigade should be identified at Ft. Knox. The alternate facility would be a hedge against late availability of the new facility.

Locate some simulators at remote sites. Some simulators should be located at the home station of remotely located units participating in Virtual Brigade training.

Pour Tactical Operation Center (TOC) pads outside the simulation facility. Units can bring their actual TOC equipment to the pad and connect into the communications

systems. TOCs and logistics headquarters also could be established in unit motor pools.

Build a realistic Fire Direction Center (FDC) capability that imposes appropriate delays and errors into fire support play. Forward Entry Devices (FED) and Digital Message Device (DMD) hook-ups should be provided for Forward Observers. The FDC (one of the generic pod configurations) should receive FED/DMD input and the FDC should be able to generate the appropriate response on the virtual battlefield. The FDC should be capable of receiving verbal calls for fire as well.

Link these facilities with an improved communications network. The two Ethernets in the SIMNET facilities are capable of interconnecting up to about 800 entities. They need to be upgraded to handle 3,000 or more entities. The SIMNET tactical communications systems needs to be replaced by a digital network capable of more channels and capable of extending to motor pools, outside pads, and remote sites. Connections to remote sites or alternate facilities at Ft. Knox will require a wide area digital network.

Battle Management Recommendations

Battle casualties must be assessed in the same manner that combat vehicle damage is currently assessed. The Battle Master must control personnel who have been assessed as casualties, and after a designated time delay, integrate them into the replacement system. A Personnel Service Support simulation should be added that produces casualties.

Supply activities and reconstitution of vehicles and equipment must be similarly managed. The maintenance failure generation capability should be expanded to include a broader range of failures, and the resupply system should be expanded to include more than just fuel.

Recommended Program Actions

Immediately initiate a detailed training analysis to determine exactly which tasks and skills should be trained. This should be a dedicated effort and will require many man-months to complete.

Combine the Contractor Logistics Support (CLS) (plus Operations) throughout the SIMNET facility. The CLS currently provided is not sufficiently robust to meet the needs of Virtual Brigade. The definition of the support required should be expanded. The amount of equipment to be managed will grow, the type of equipment will change, and the role of the Battle Master and the technical support during a training exercise will change.

IDA

VIRTUAL BRIGADE TRAINING PROGRAM

SIMULATOR REQUIREMENTS ANALYSIS

BY THE

INSTITUTE FOR DEFENSE ANALYSES (IDA)

QUICK LOOK TEAM (QLT)

Nov 93 - Feb 94

BG (RET.) ARTHUR JUNOT
COL (RET.) LARRY MENGEL
COL (RET.) DON APPLER
DR. ROBERT WORLEY
MS. JULIA LOUGHRAN

QUICK LOOK TEAM'S (QLT) TASK

The task assigned to the QLT was to develop the preliminary functional requirements analysis for the VBTP. At the time of this tasking, however, the VBTP was an evolving concept with a variety of interpretations. It was necessary to take a broad view of the task and develop some of the fundamental assumptions upon which the VBTP could be built.

The first of these assumptions was a conceptual macro training strategy. Training strategies for maneuver battalions are well documented and understood. However, training strategies are much less specific in the Combat Support (CS) and Combat Service Support (CSS) arenas.

Second, the organization of the 194th Armor Brigade, the unit that will be the first to use this concept, is very much in flux. Its current Table of Organization and Equipment (TO&E) is non-standard and numerous changes are anticipated by the time the VBTP becomes a reality. It was necessary to assume a target TO&E for the purposes of this study effort.

Third, there was no dominant concept for the architecture of the program. The QLT had to develop a conceptual architecture upon which to base its analysis.

These assumptions, which will be explained in this briefing, are the team's ideas of how VBTP could evolve. They represent a way, but by no means the only way. These assumptions and the analysis developed from them will serve as a solid start point for the Ft. Knox PATs to build the VBTP.

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QUICK LOOK TEAM'S (QLT) TASK

DEVELOP THE PRELIMINARY FUNCTIONAL REQUIREMENTS ANALYSIS FOR THE VIRTUAL BRIGADE TRAINING PROGRAM.

VIRTUAL BRIGADE DEFINITION

The Virtual Brigade is not a brigade. It is a training environment that maximizes the use of Training Aids, Devices, Simulators and Simulations (TADSS). It is an environment where a brigade can train all of its subordinate units either singly or together. In a world with unlimited resources and plenty of terrain, the optimum Virtual Brigade would be continuous field training, but this is no longer possible. Recognizing that field training to some extent will always be necessary, the fundamental question becomes: *What is the best mix of TADSS and field training?*

The VBTP is a demonstration of the VB concept applied to the very real-world problem of preparing the 194th Separate Armored Brigade at Ft. Knox for its National Training Center (NTC) rotation in May 1996. Given these parameters, the question of the proper mix of training resources must be constrained by the resources that are currently available to the brigade and those that might reasonably be made available to them in the interim. Therefore, Virtual Brigade is not a "pie-in-the-sky" theory, but a resource- and time-constrained effort to provide the best possible training.

While the focus of the VBTP is training, there are clearly other applications. A credible training environment can serve as a test bed for developing new tactics, techniques, and procedures (TTP); it can be used to support Combat Development (CD) studies and analysis; it can be used to develop contingency plans; and it can be used for mission rehearsals as well. A very specific application for VBTP is the requirement to integrate new Digitized Battlefield technologies into the 194th Brigade. The VBTP provides a unique opportunity to develop the doctrine for, and to train to use, these technologies.

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VIRTUAL BRIGADE -- DEFINITION

AN ENVIRONMENT OF INTEGRATED TRAINING AIDS, DEVICES, SIMULATORS, & SIMULATIONS (TADSS) AND FACILITIES IN WHICH A BRIGADE CAN TRAIN TO ACHIEVE AND SUSTAIN COMBAT READINESS WITH MINIMUM RELIANCE ON FIELD TRAINING.

DIMENSIONS OF THE TASK

Developing a training program for a brigade is a complex, multidimensional task. Add to it the non-training applications and the number of factors to be addressed becomes enormous. A two-dimensional piece of paper is inadequate to show the totality of the interactions that must be addressed. Suffice it to say that each parameter on each axis must intersect with all of the others. Resources to address any one intersection must be balanced against all of the others, making for many decisions.

Read the chart as a series of complex questions. Pick one item and from each dimension and draw out the collective implications. For example, starting on the testing axis and moving clockwise one might choose the following: Operational Testing, Active Component, High Intensity Conflict, Company, Maneuver (dismounted infantry), Training, Specifications, and Software. *What are the specifications for the software for training an active component, mechanized infantry company (dismounted), in a high intensity conflict situation?* Now change from active component to reserve component and it becomes a whole new question.

Each and every possible question in this multidimensional matrix must be addressed (or consciously ignored) in building the Virtual Brigade. Any solutions generated from an analysis must be able to fit into the matrix and must be consistent with any other solutions.

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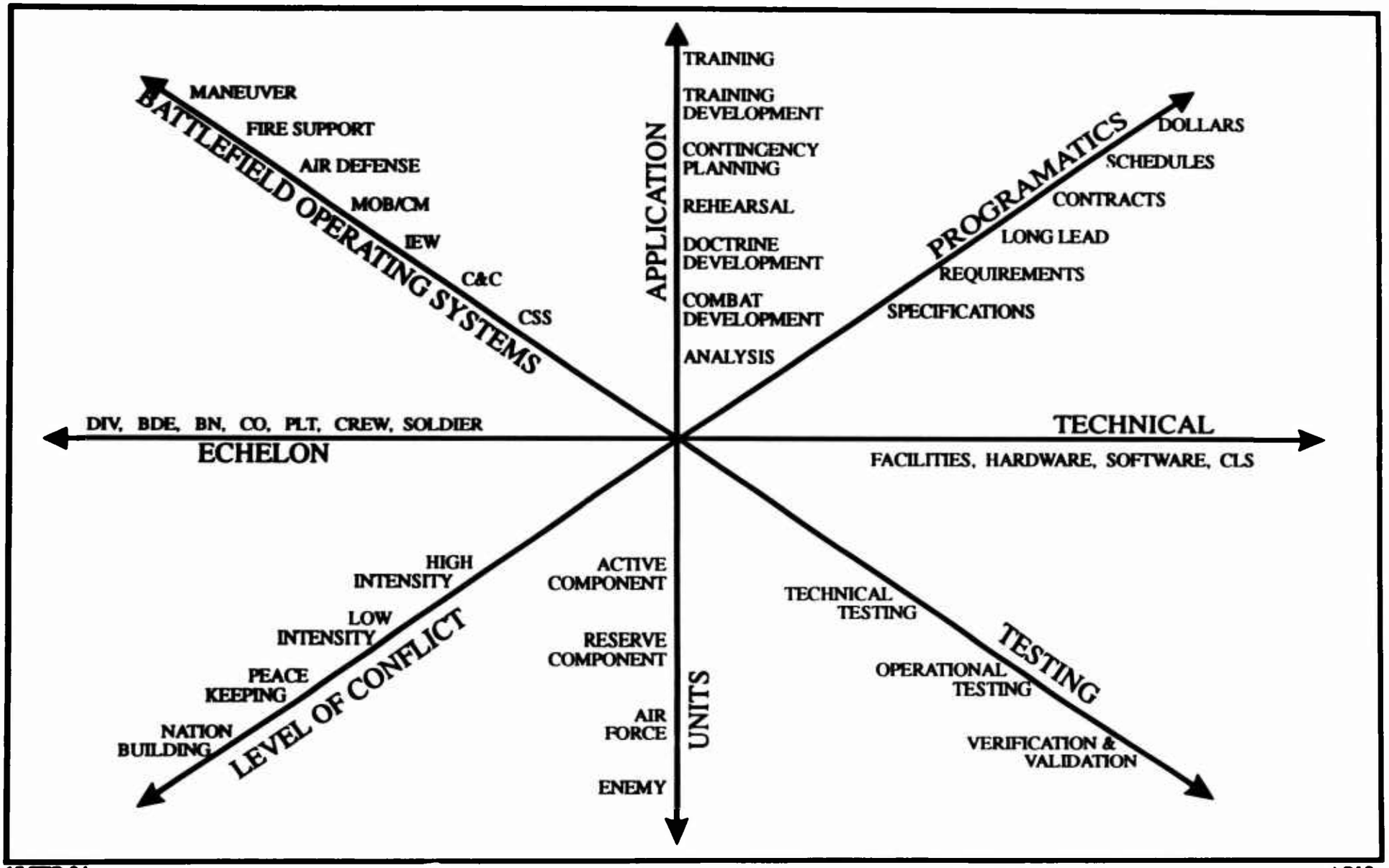
DIMENSIONS OF THE TASK



QUICK LOOK TEAM'S FOCUS

A quick analysis could not possibly address all of the implications of the matrix. The team concentrated on a limited set, recognizing that the Ft. Knox PATs will do the rest.

- For purposes of this analysis the QLT focused on training and assumed that the schedule was being driven by a May 1996 end date.
- Some facilities are a given. SIMNET is there but it has only so many assets.
- Some hardware is available in industry that could be procured off the shelf, but developmental hardware probably cannot be completed in time to affect the VBTP.
- Operational testing is a significant issue for all. Engineers can tie a lot of "stuff" together, but the soldiers deserve assurance that it works.
- The brigade is composed of both active and reserve component units. VBTP must be able to train them together.
- High intensity conflict is probably the most demanding. If VBTP can work there, it should work for the others. (Bad assumption!)
- Collective training is the area that needs emphasis. Soldier skills training is already well supported with TADSS.
- All of the Battlefield Operating Systems are addressed except Intelligence and Electronic Warfare (IEW). IEW is important, but the technology to integrate it into the brigade's training is not available and would take a long time to develop.

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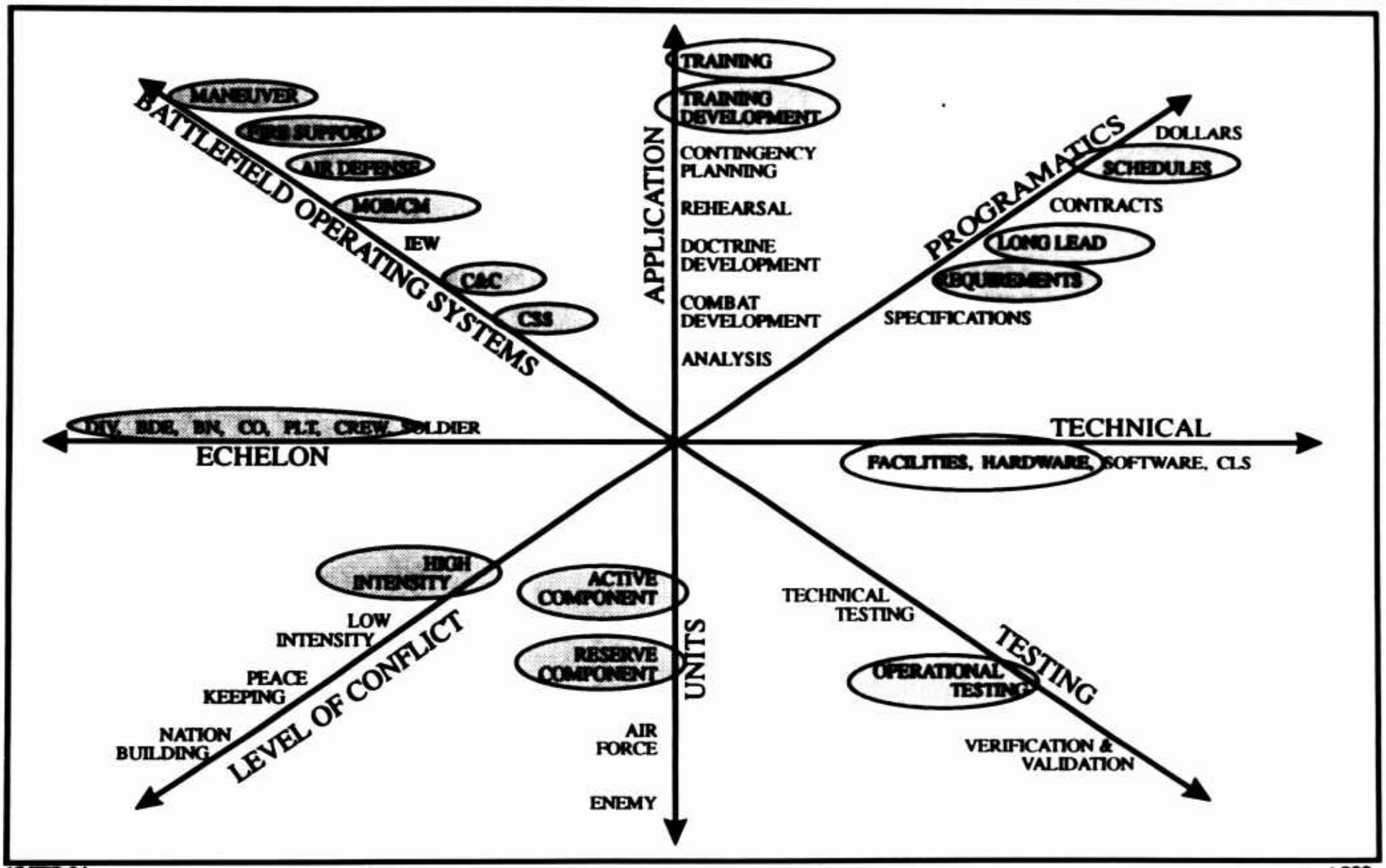
QUICK LOOK TEAM'S FOCUS



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METHODOLOGY & BRIEFING OUTLINE

The QLT followed the process outlined here and the briefing follows the same outline.

(1) The team developed a macro training strategy that describes in general how the brigade might use its training time and resources.

(2) The projected Brigade TO&E was built into a database that could be manipulated to compute requirements for various exercises.

(3) The training strategy and TO&E were mapped together to determine requirements (numbers of simulator, by type) for a spectrum of training events.

(4) While the training side of the team was conducting the training analysis, the technology side of the QLT was canvassing industry to determine what technologies would be available to support the training requirements.

(5) A facilities concept was developed to guide and constrain the selection of technical solution to the requirements.

(6) All of the above were mapped together in an analysis and allocation process which resulted in the recommendations about what should be done to create the Virtual Brigade.

(7) Finally, a Roadmap (PERT-style Network) was built to outline the steps that should be taken to complete the Virtual Brigade in time to prepare the 194th Brigade for its May 1996 rotation.

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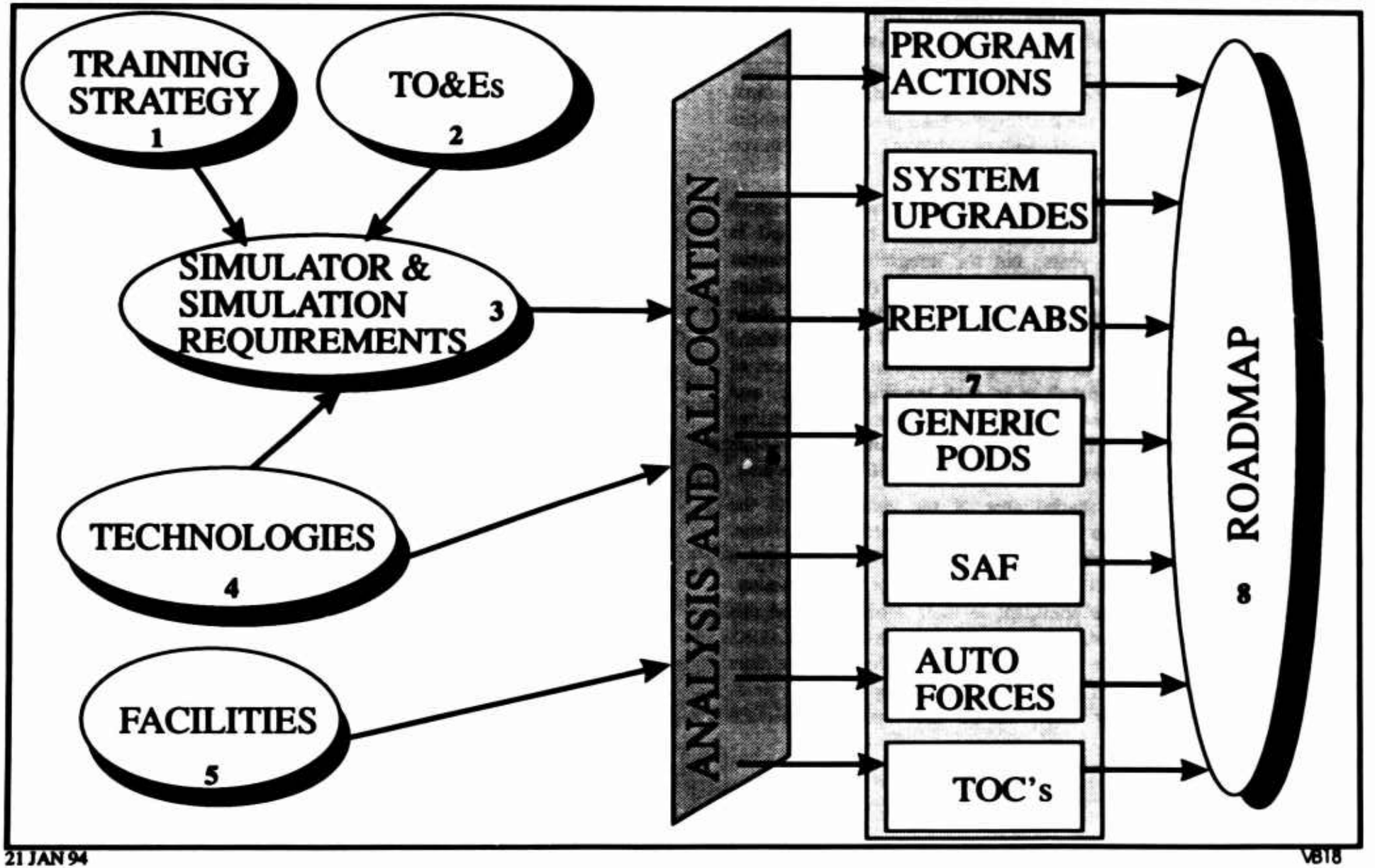
METHODOLOGY & BRIEFING OUTLINE



VIRTUAL BRIGADE CONCEPTUAL ARCHITECTURE

Virtual Brigade must support collective training from the squad to the division. Division is included because the brigade commander is himself a trainee. In order for him and his staff to be properly immersed in the training, there must be a representation of the next higher headquarters that places requirements on the Brigade and provides an additional source of "battlefield confusion."

Virtual Brigade must also support training across the spectrum of battlefield functions. Combat units have been trained in SIMNET for several years, but the integration of Combat Support (CS) and Combat Service Support (CSS) functions into the training has been marginal. At the brigade level these functions play a significant role. CS and CSS must be trained and provided practice in operating their systems in support of the combat elements involved in each training exercise, and the whole brigade must learn how to integrate these functions into the battle. This aspect of the architecture implies significant enhancements to the current SIMNET architecture.

The bubbles in the shaded area of the chart indicate the domain of the various TADSS and their general interactions. The boundaries are not precisely known; they will evolve over time. There will always be a need for field training. Soldiers must become confident in their equipment and this can only be achieved under field conditions. The TADSS training is the prelude to field training. It allows the soldiers and units to learn their skills so that when they go to the field, they can hone their skills rather than wasting precious resources learning what could have been learned in a less expensive environment.

In this architecture, Battalion/Brigade Battle Simulation (BBS) provides the overarching simulation to maintain battlefield coherency across the battlefield functions while providing training to the Brigade commander and staff as well as some of the subordinated elements. It can fill out the battlefield in areas where simulator resources are inadequate. Efforts are underway to develop a BBS-SIMET interface that will allow interactions of the two simulations. The interface was demonstrated in U.S. Army Europe (USAREUR) in January through February 1994.

JANUS is an alternative trainer for the Battalion and Brigade level skills. It is being used in the National Guard (NG) and in some Active Component (AC) units. It is part of the existing inventory of simulations that need to be linked into the Virtual Brigade. A JANUS-SIMNET interface is also being developed, but as of February 1994 it had not yet been demonstrated.

Combat Service Support/Training Support Simulation (CSS/TSS) provides the environment for controlling the availability of supplies and services to the brigade. By properly managing CSS at the division level, the units in training can be forced to operate under realistic logistical constraints. CSS/TSS is a simulation model under development and may or may not be available for use in time to support VBTP.

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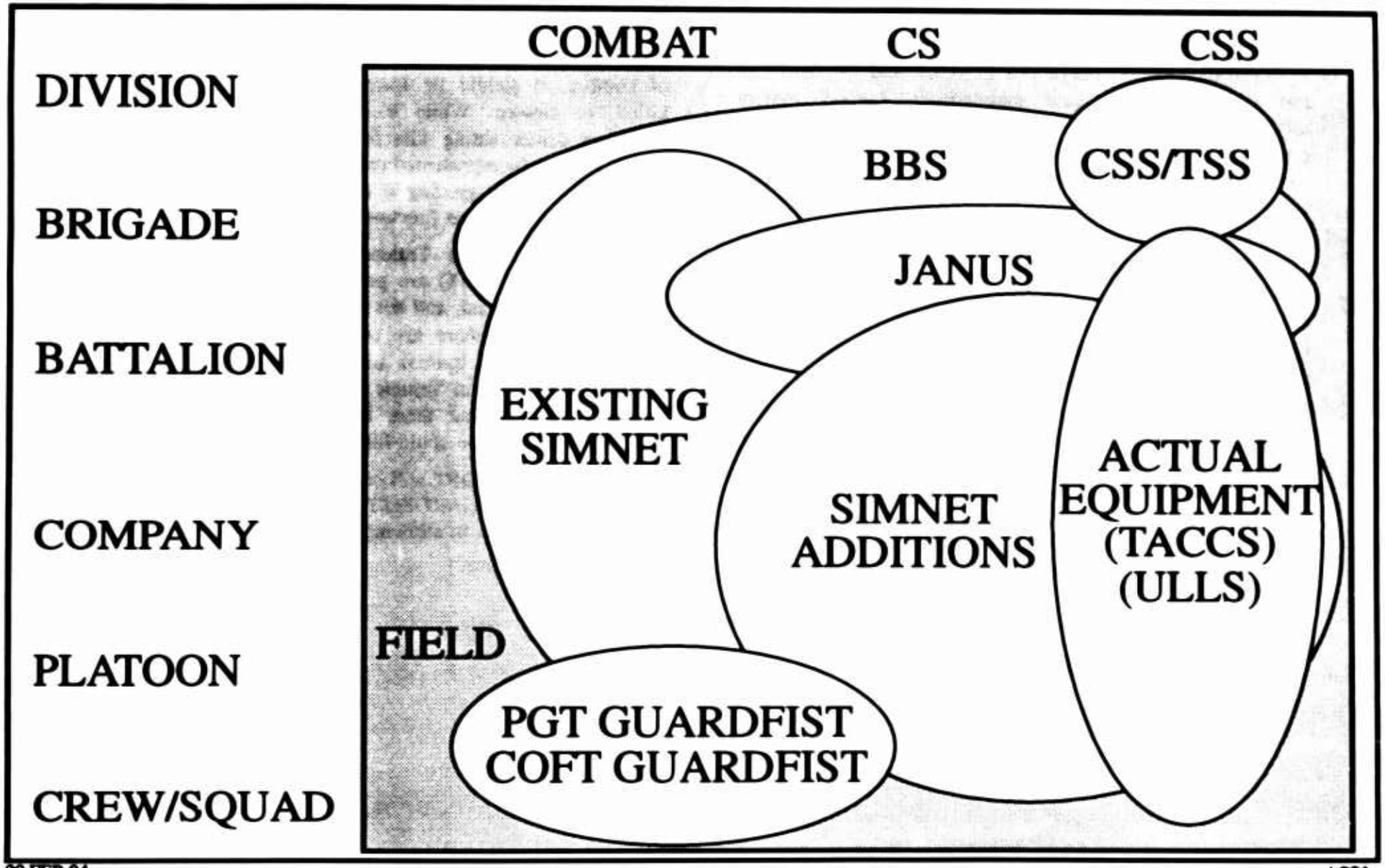
VIRTUAL BRIGADE CONCEPTUAL ARCHITECTURE



VIRTUAL BRIGADE CONCEPTUAL ARCHITECTURE (continued)

Actual equipment and support systems used within the brigade in day-to-day support operations (TACCS and PC hardware and standard supply and maintenance support system software) can be tied into the Virtual Brigade. They will generate support requirements in response to the simulated combat actions, exercise the support systems in direct relation to the combat exercises, and realistically constrain combat activities in direct relation to CSS activities.

For this aspect of the Virtual Brigade to work properly, the training events in should be fought at "mid-war." Logistics does not get stressed until after about 7 days. The implication is that training events should be initialized at the 7 to 10 day period or that events should be run for at least 10 days.

The existing SIMNET contains valuable resources for Virtual Brigade, but they are limited in number and type. These resources must be enhanced to meet the needs of some additional combat functions (e.g., dismounted infantry) and most of the CS and CSS functions. The critical factor is to ensure that time and distance factors, visibility, and vulnerability are properly maintained on the battlefield. For example, if a bulldozer is needed at the Forward Line of Own Troops (FLOT), it should be required to move via its transporter from its current location to where it is needed under combat conditions and subject to all of the indignities of combat. It should be susceptible to being lost, stuck, killed, or slowed. While it is not necessary to have a bulldozer driver sitting idle in a simulator, the bulldozer should at least be represented on the battlefield and those who are responsible for guiding it to its point of use should be required to perform that function.

The Conduct of Fire Trainer (COFT) and the Platoon Gunnery Trainer (PGT) are proven tools for training crew skills on the M1 Tank and the M2 Bradley Fighting Vehicle (BFV). However, there are several other vehicles on the battlefield for which trainers are not available. For example, the Fire Support Team Vehicle (FIST-V) plays a critical role on the battlefield, but there is no comparable trainer. A SIMNET enhancement could fill this void.

GUARDFIST and COFT will be the NG's system for training tank crew skills. (GUARDFIST has not been fielded to date. It will fill a key role in allowing NG soldiers to train on their actual equipment.)

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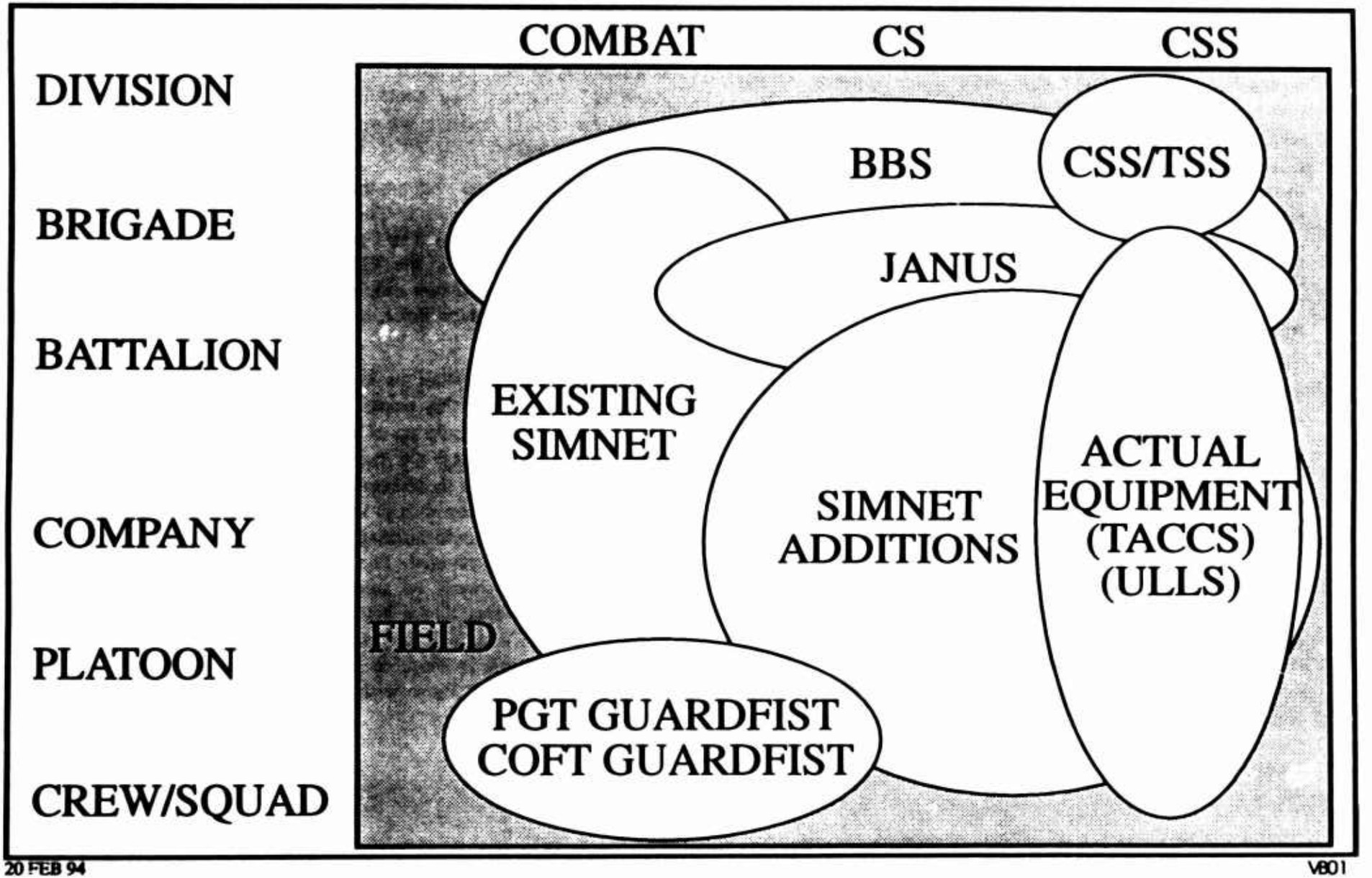
VIRTUAL BRIGADE CONCEPTUAL ARCHITECTURE



NOTIONAL MACRO TRAINING STRATEGY

The training strategy outlined here is not an official training strategy of the 194th Brigade. It is a creation of the QLT that represents a way of addressing the training needs of the Brigade. It addresses only the TADSS portion of the training which, as stated earlier, would always be accompanied by sufficient field training to ensure soldier and unit confidence in their equipment and demonstrated proficiency in assigned tasks and missions.

The foundation of the strategy is frequent and continuous individual and crew training. Soldiers must be proficient in their individual skills before they graduate to collective skills training.

The concept of training in Virtual Brigade is to conduct Virtual Training Exercises (VTXs). A VTX is a tailored exercise in which the primary training audience is assigned to simulators or simulations and the rest of the organization is filled out with SAF or other automated forces. (See next chart.)

Combat platoon or company exercises should occur weekly. This training is focused on ensuring that a unit is able to perform each Mission Essential Task List (METL) task. Ideally, all crews in the platoon will be fully manned. However, the reality is that this seldom happens. Vehicles without crews need to be simulated in the unit formations via Semi-Automated Forces (SAF). Adjacent units should also be simulated by SAF to ensure that the coordination requirements are exercised. Appropriate parts of the CS capability should also be present in the training. Artillery Forward Observers (FOs) and Engineer vehicles, in particular, should be directly involved via some form of simulator. During the After Action Reviews (AAR) for these small unit exercises, attention should be focused on how well individual command and control skills were performed and the results should indicate where additional individual skills training is necessary.

CS and CSS platoons and companies do not need to train independently in simulators. They conduct their individual and crew training on their actual equipment or with simulations. They train in the Virtual Brigade by using their assigned system hardware in performing their role of supporting the maneuver force, whenever maneuver training is occurring.

Combat (maneuver) battalions should conduct two to three day exercises on a monthly basis. These exercises are focused on missions that are made up of many associated tasks. The tasks overlap and many are trained simultaneously as the mission is executed. In these exercises the combat battalion is fully manned (assets permitting) and the appropriate elements of the brigade that would normally support the battalion (the slice) would also be manned. The decision of what should be manned and what should be automated is complex. This is partly due to the fact that a battalion plus its slice requires more simulators than will be available. Trade-offs must be made. A useful rule in these decisions is that "vehicles with radios get simulations, those without are represented by SAF or other simulators."

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NOTIONAL MACRO TRAINING STRATEGY

1. FREQUENT (CONTINUOUS) INDIVIDUAL & CREW TRAINING IN SIMULATIONS (E.G., COFT, PGT, OTHER)

2. WEEKLY PLATOON / COMPANY VTXs -- SHORT (4 HOUR) EXERCISES.
   - TASK FOCUSED.
   - COMBAT UNITS MANNED TO VEHICLE LEVEL.
   - COMBAT SUPPORT SLICE OF THE BDE INCLUDED.
   - MANNED TO VEHICLE LEVEL.
   - SAF THE ADJACENT COMPANIES.

3. MONTHLY BATTALION VTXs -- 2/3 DAY EXERCISES.
   - MISSION FOCUSED.
   - COMBAT UNITS MANNED TO VEHICLE LEVEL.
   - COMBAT SUPPORT SLICE OF THE BDE TO PLATFORM LEVEL.
   - COMBAT SERVICE SUPPORT SLICE OF THE THE BDE TO CO LEVEL.
     - (INCLUDE CSS COMMUNICATORS.)
   - SAF THE ADJACENT COMPANIES.
   - BBS/JANUS THE REMAINDER OF THE CS AND CSS.

4. QUARTERLY BRIGADE LEVEL VTXs -- 7/10 DAY EXERCISES.
   - MISSION FOCUSED.
   - COMBAT, COMBAT SUPPORT MANNED TO COMPANY COMMANDER LEVEL.
   - CSS UNITS MANNED DOWN TO DECISION MAKER LEVEL.
   - DIVISION RESPONSE CELL.
   - BBS, JANUS, SAF FLESH OUT THE BDE.

NOTIONAL MACRO TRAINING STRATEGY (continued)

The Brigade itself should train quarterly. These mission-focused exercises should have a duration of 7 to 10 days to ensure that CSS functions get fully exercised. Combat units can participate either in fully manned simulators or in simulations. In fact, they could swap roles during the exercise to ensure that everyone gets to work in the simulators. CS and CSS units should be manned by decision makers at each level from section to battalion. Sufficient additional personnel are required to operate the support systems in accordance with field Standard Operating Procedures (SOP) without the necessity of actually performing repair and resupply missions. These exercises need a division-level response cell to put the brigade commander and his staff in the role of trainee.

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NOTIONAL MACRO TRAINING STRATEGY

1. FREQUENT (CONTINUOUS) INDIVIDUAL & CREW TRAINING IN SIMULATIONS (E.G., COFT, PGT, OTHER)

2. WEEKLY PLATOON / COMPANY VTXs -- SHORT (4 HOUR) EXERCISES.
   - TASK FOCUSED.
   - COMBAT UNITS MANNED TO VEHICLE LEVEL.
   - COMBAT SUPPORT SLICE OF THE BDE INCLUDED.
   - MANNED TO VEHICLE LEVEL.
   - SAF THE ADJACENT COMPANIES.

3. MONTHLY BATTALION VTXs -- 2/3 DAY EXERCISES.
   - MISSION FOCUSED.
   - COMBAT UNITS MANNED TO VEHICLE LEVEL.
   - COMBAT SUPPORT SLICE OF THE BDE TO PLATFORM LEVEL.
   - COMBAT SERVICE SUPPORT SLICE OF THE THE BDE TO CO LEVEL. (INCLUDE CSS COMMUNICATORS.)
   - SAF THE ADJACENT COMPANIES.
   - BBS/JANUS THE REMAINDER OF THE CS AND CSS.

4. QUARTERLY BRIGADE LEVEL VTXs -- 7/10 DAY EXERCISES.
   - MISSION FOCUSED.
   - COMBAT, COMBAT SUPPORT MANNED TO COMPANY COMMANDER LEVEL.
   - CSS UNITS MANNED DOWN TO DECISION MAKER LEVEL.
   - DIVISION RESPONSE CELL.
   - BBS, JANUS, SAF FLESH OUT THE BDE.

VIRTUAL TRAINING EXERCISE (VTX)

The term "Virtual Training Exercise (VTX)" is a new term created to describe the type of training that will be conducted in the Virtual Brigade. The standard training terminology of Command Field Exercises (CFX), Field Training Exercises (FTX), and so on do not properly reflect the dynamics of the Virtual Brigade. In this new environment, units will tailor their exercises to meet the needs of the available training audience. They will man the desired simulators and workstations and then fill out the surrounding battlefield with SAF or other automated forces.

The shaded areas in the chart represent several different VTX configurations. Pick one shaded section to be manned and then represent everything else in SAF. The smaller area in the center represents a Company VTX with the elements manned from the battalion commander down to individual vehicles. Adjacent companies and brigade slice elements would be SAF. The battalion commander, or his surrogate, would be present to provide realistic responses to the company commander's communications.

The larger shaded area represents a Brigade VTX with elements manned down to company commander level. This VTX is a trade-off of lower level functionality in order to exercise a broad span of control. It is cut off at the company commander level because of resources. As will be shown later in the briefing, this exercise will consume most of the available resources. There is no realistic way to man the entire brigade down to platoon level.

The shaded areas in between represent a spectrum of options. The key point is that the VTX is tailored to meet the training need. The common characteristic of all VTXs is that they are set in a full brigade context. Even a platoon or company level VTX can take place on a battlefield where the all elements of the brigade are actively represented.

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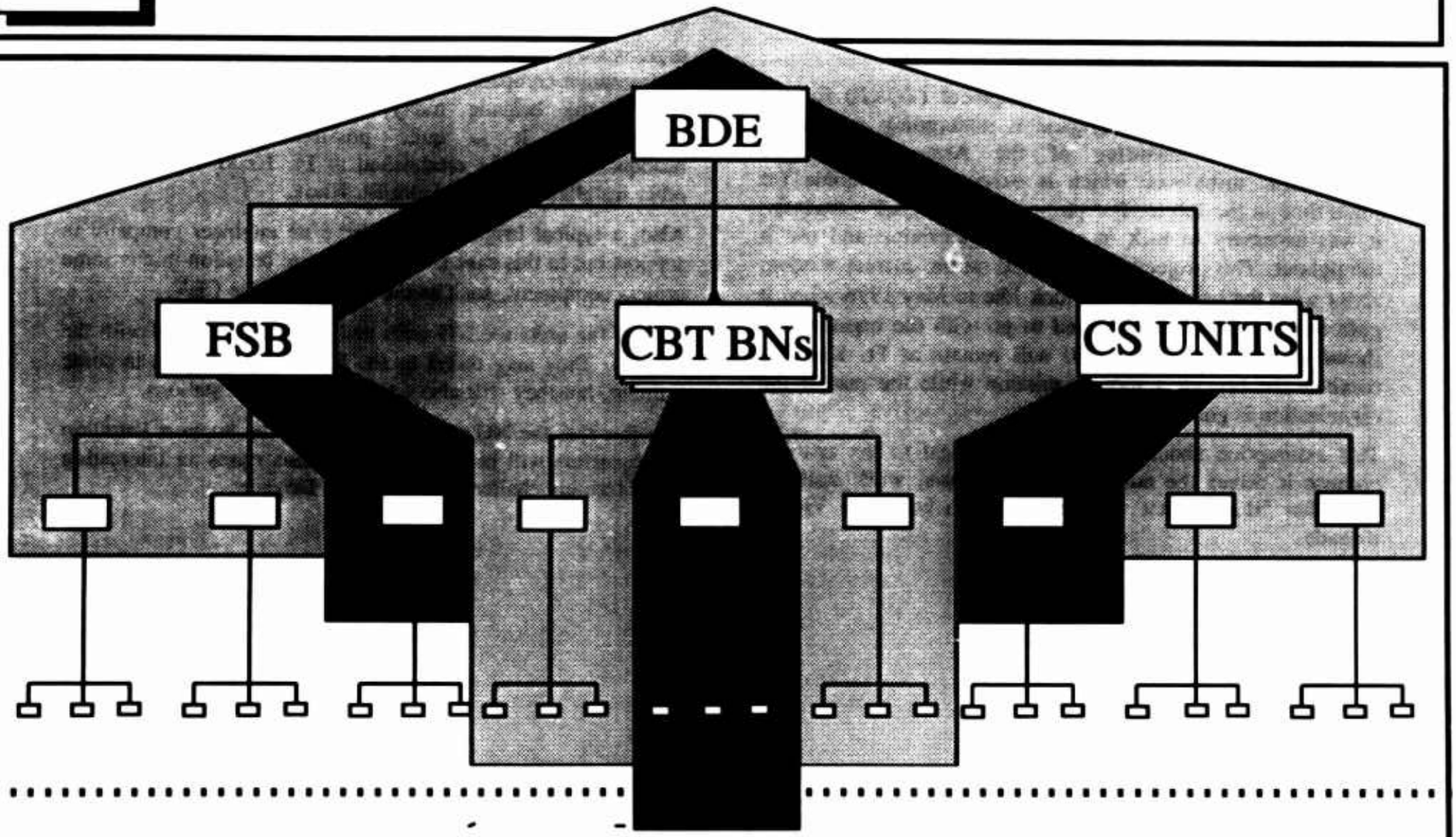
VIRTUAL TRAINING EXERCISE (VTX)



VTX = MAN ONE SHADED AREA: FLESH OUT THE BDE WITH SAF OR AUTOMATED FORCES.

194th SEPARATE ARMORED BRIGADE ORGANIZATION FOR TRAINING

The Table of Organization and Equipment (TO&E) for the 194th Separate Armored Brigade is undergoing continuous change. The restructuring of the Army has created considerable turbulence which is expected to continue for some time in the future. For purposes of the QLT's analysis, it was necessary to lock in on one organization and use it throughout. This projection was based on the current wisdom about what the brigade would look like in May 1996 when it goes to the NTC. It is expected to go with the organization shown on this chart. TF 1-70 will remain at Ft. Knox to continue the brigade's support mission while the rest of the organization is gone.

This assumption about the TO&E is critical to the analysis because it drives the numbers of simulators, work stations, and other "things" that will be needed to build the Virtual Brigade.

Of particular note is the 75th Support Battalion. This organization does not exist today. Separate supply and maintenance companies, plus elements of a medical battalion are in the brigade today, but there is no battalion headquarters. It is quite possible that the battalion headquarters will be established at Ft. Hood, TX, or some other installation distant from Ft. Knox.

Also, a typical brigade would have an engineer company in support but in this case there is an entire battalion minus some critical equipment, such as the AVLB and the CEV.

Two of the units are NG units and are not collocated with the brigade. They may travel to Ft. Knox to participate in some training, but they will also train at their home stations.

The fact that the NG units and possibly the Support Battalion Headquarters will be at distant locations raises an interesting set of training challenges for Virtual Brigade.

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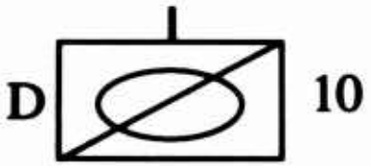
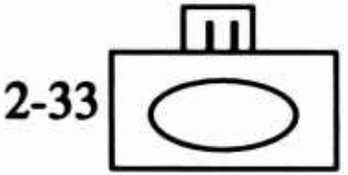
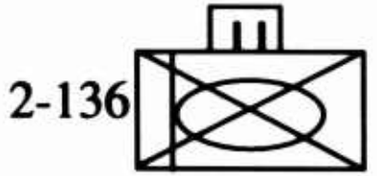
194th BDE ORGANIZATION FOR TRAINING (PROJECTED TO MAY 96)



2 TANK PLT
2 CFV PLT



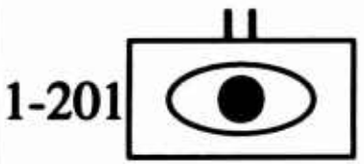
3 TANK CO
1 MECH CO



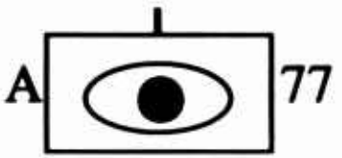
3 MECH CO (MN NG)
1 TANK CO (KY NG)

WILL NOT DEPLOY WITH THE BDE

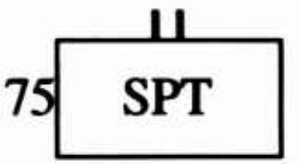
3 TANK CO
1 MECH CO



3 X 8
WVA NG



NO ACES,
AVLB, OR CEV



1 S&T CO
1 MAINT CO
1 MED CO

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V821

VEHICLE CATEGORIES

The 194th Armored Brigade has over 50 vehicle types. To make the analysis of the TO&E manageable, vehicles were grouped into 16 categories. Each category is suggestive of a unique set of simulator requirements. For example, seven different vehicles are all variations of the Armored Personnel Carrier (APC). One basic simulator could be adapted to represent all of these vehicles. The other categories require uniquely different base vehicles.

Categories are defined as:

BFV	Bradley Fighting Vehicle
DOZER	Bulldozer type vehicles, including M9 ACE
DUMP	Dump trucks
EVAC	Evacuators, such as a back hoe
FUEL	Fuel trucks
HOW	Howitzers
HV-T	Heavy trucks
LIFT	Fork lift vehicles
LT-T	Light trucks
MED-T	Medium trucks
TANK	Tank-like vehicles
VTR	Tracked Recovery Vehicles
Wrecker	Wheeled recovery vehicles
DI	Dismounted infantry and any other dismounted elements (counted in terms of squads)

VEHICLE CATEGORIES

APC	BFV	DOZER	DUMP	EVAC	FUEL	HOW	HV-T
COLT	M2	M9	M51	JD410	M978	M109	HEMTT
FDC	M3		M817	SEE			HET
FIST-V							M878
M113							M916
M548							M977
M577							
M901							

LIFT	LT-T	MED-T	MORT	TANK	VTR	WRECKER	DI
M10A	HMMWV	FOX	M106	AVLB	M578	M543	INF SQUAD
M4K	M1009	GEMSS		M1	M88	M816	
RTFL	M1025	M35		M1A1		M936	
	M1028	M54		M1A2		M984	
	M1038	M813		M728			
	M996	M923					
	M998						
	STINGER						
	TACP						

AS OF 4 JAN94

SAMPLE OF THE 194TH SAB TO&E DATABASE

The training requirements analysis began with a TO&E database configured by vehicle category and by unit down to platoon level. This is a sample of the database showing the level of detail contained in it.

It should be noted that this database is not complete. The TO&E of the Brigade is not constructed at this level of detail. It was necessary, therefore, to interpret the TO&E using generic reference data. It is probably 90 percent accurate. If this methodology is followed in the future, the database must be scrubbed and purified.

This full database is displayed in Appendix A.

SAMPLE OF THE 194TH BDE TO&E DATABASE

A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
83						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
84	TF 2-136																					
85		HHC																				
86			CMD SEC				1								2							3
87			S-1													1						1
88			S-2			1																1
89			S-3			2	1								2	1						6
90			S-4			1									1							2
91			HQ SEC			1									2	2						5
92			COMMO SEC												2							2
93			SCOUT PLT				6															6
94			MORTAR PLT			2									2		6					10
95			SPT PLT								17		16			6						39
96			MESS												1	3						4
97			MED PLT			10									1	1						12
98			MAINT PLT												2							2
99				SUPPLY SEC												5						5
100				RECOVERY SEC												1			3	2		6
101				MAINT SEC											1	4						5
102				CO A TEAM		1										1			1			3
103				CO B TEAM		1										1			1			3
104				CO C TEAM		1										1			1			3
105				CO D TEAM		1										1			1			3
106			UNIT MINISTRY												1							1
107		CO A (TANK)																				
108			HQ SEC												1	1		2				4
109			1ST PLT															4				4
110			2ND PLT															4				4
111			3RD PLT															4				4
112		CO B (MECH)																				
113			HQ SEC			1	2								2	2					1	8
114			1ST PLT (RIFLE)				4														3	7
115			2ND PLT (RIFLE)				4														3	7
116			3RD PLT (RIFLE)				4														3	7
117			4TH PLT (AT)			5																5
118		CO C (MECH)																				
119			HQ SEC			1	2								2	2					1	8
120			1ST PLT (RIFLE)				4														3	7
121			2ND PLT (RIFLE)				4														3	7
122			3RD PLT (RIFLE)				4														3	7
123			4TH PLT (AA)			5																5
124		CO D(MECH)																				
125			HQ SEC			1	2								2	2					1	8
126			1ST PLT (RIFLE)				4														3	7
127			2ND PLT (RIFLE)				4														3	7
128			3RD PLT (RIFLE)				4														3	7
129			4TH PLT (AT)			5																5
130	TF 2-136	SUB-TOTAL				39	50				17		16		24	35	6	14	7	2	30	240
131		SIM																				
132		UNASSIGNED																				
133		SAF																				
134		BBS/JANUS				39	50				17		16		24	35	6	14	7	2	30	240

RESOURCE ALLOCATION CRITERIA

Five criteria were invoked to determine how best to represent each vehicle.

a. **Dynamic Presence.** If the vehicle needs to be seen, to traverse the terrain database, and to be vulnerable on the battlefield, then it should at least be represented as an automated force entity. For example, it could be represented by BBS or JANUS. An example of this type of vehicle is the logistics support for SAF units on the flanks of the training units.

b. **Dynamic Presence with Positive Control over Entities.** If the vehicle requires dynamic presence, but the commander wants direct control over how it operates, then it is represented as a SAF entity. This is done where the vehicle in question (such as the fuel trucks) must operate in close proximity to manned simulators.

c. **Radio Presence.** If the vehicle (or system) meets both of the above conditions, but it is an active participant in the communications networks of the brigade, then it is represented by, at least, a "pod." A pod is a workstation with simple controls, radio communications and an out-the-window view of the battlefield. (The pod will be discussed more later.) The pod allows the operator to participate directly in the battle and to influence the command and control dynamics of the battle. However, it makes no pretense about training the operator in the operation of his vehicle. Pods are rapidly reconfigurable into any one of a large variety of vehicle configurations.

d. **Crew Dynamics.** If the vehicle's role in the battle depends on the crew's interactions (i.e., the crew fights the vehicle), then the vehicle is represented as a *replicab*. A replicab is any simulator that provides the form-and-fit-fidelity necessary to train crew functions. Thus, it has dimensional accuracy and the realistic controls to approximately replicate the actual vehicle. These systems provide the capability for trained individuals and crews to participate in a collective training environment. Replicabs may have a fixed configuration or could be designed with the capability for reconfiguration to a few variants.

e. **Intermittent Usage.** Some vehicles need to be represented as pods or replicabs, but they are idle much of the time. An example is the VTR. It waits for a requirement, but when that requirement arises the VTR crew can "hotseat" a pod or a replicab. A dedicated simulator is not required, because the VTR is only active on an occasional basis.

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RESOURCE ALLOCATION CRITERIA

RESOURCES / CRITERIA	AUTOMATED FORCES	SAF	POD	REPLICABS	UNASSIGNED
DYNAMIC PRESENCE	✓	✓	✓	✓	✓
DYNAMIC PRESENCE WITH POSITIVE CONTROL OVER ENTITIES		✓	✓	✓	✓
RADIO PRESENCE			✓	✓	✓
CREW DYNAMICS				✓	✓
INTERMITTENT USAGE					✓

SAMPLE OF THE TRAINING EVENT DATABASE

The TO&E database was used as the baseline for the training requirements analysis. Seven sample VTXs, representing a spectrum of probable VTXs, were constructed by two surrogate commanders (Mengel and Appler). The process involved going through the matrix and making a determination as to how to represent each vehicle in the exercise. This process was repeated for each exercise and the results were then tallied to determine the upper limit of simulator, SAF, and automated-forces requirements.

Note: the bottom line of subtotals on the matrix reflects the number of vehicles by category represented in each mode. These numbers indicate what a commander "might want to have" in his VTX in order to conduct the training. These data are the product of an unconstrained set of military judgments. Different commanders would make different decisions, but we believe that these numbers are at least in the right magnitude and proportion.

The VTXs analyzed were as follows:

a. Armored Heavy Task Force with brigade slice in the attack.

b. Armored Heavy Task Force with brigade slice in a movement to contact.

c. Armored Heavy Task Force with brigade slice in the defense.

d. Brigade Command Field Exercise manned down to company commander level.

e. Mechanized Infantry Heavy Task Force with brigade slice in the attack.

f. Mechanized Infantry Heavy Task Force with brigade slice in the movement to contact.

g. Mechanized Infantry Heavy Task Force with brigade slice in the defense.

SAMPLE OF THE TRAINING ANALYSIS DATABASE

F	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
83						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
84	TF 2-136																					
85		HHC																				
86			CMD SEC				1															1
87			S-1																			
88			S-2																			
89			S-3				1															1
90			S-4																			
91			HQ SEC												1							1
92			COMMO SEC																			
93			SCOUT PLT				6															6
94			MORTAR PLT			2									1							3
95			SPT PLT								4		4									8
96			MESS																			
97			MED PLT																			
98			MAINT PLT												1							1
99				SUPPLY SEC																		
100				RECOVERY SEC																		
101				MAINT SEC																		
102				CO A TEAM		1																1
103				CO B TEAM		1																1
104				CO C TEAM		1																1
105				CO D TEAM		1																1
106			UNIT MINISTRY																			
107		CO A (TANK)																				
108			HQ SEC												1			2				3
109			1ST PLT															4				4
110			2ND PLT															4				4
111			3RD PLT															4				4
112		CO B (MECH)																				
113			HQ SEC				2								1							3
114			1ST PLT (RIFLE)				4															4
115			2ND PLT (RIFLE)				4															4
116			3RD PLT (RIFLE)				4															4
117			4TH PLT (AT)			5																5
118		CO C (MECH)																				
119			HQ SEC				2								1							3
120			1ST PLT (RIFLE)				4															4
121			2ND PLT (RIFLE)				4															4
122			3RD PLT (RIFLE)				4															4
123			4TH PLT (AA)			5																5
124		CO D (MECH)																				
125			HQ SEC				2								1							3
126			1ST PLT (RIFLE)				4															4
127			2ND PLT (RIFLE)				4															4
128			3RD PLT (RIFLE)				4															4
129			4TH PLT (AT)			5																5
130	TF 2-136	SUB-TOTAL				39	50				17		16		24	35	6	14	7	2	30	240
131		SIM				21	50				4		4		7			14				100
132		UNASSIGNED				11																11
133		SAF				4					13		12				6		7			42
134		BBS/JANUS				3									17	35				2	30	87

SUMMARY OF EXERCISE REQUIREMENTS

The results of this analysis are summarized on this chart. The number of simulators (replicabs or pods) are in the top group. The bold line below this group is the maximum number in each row. It represents the upper bound on the requirement.

The middle group shows the number of crews for which there is no dedicated simulator. These will be assigned to a simulator on an as-required basis. As will be discussed later, this creates a challenging management problem. However, it also economizes on the number of simulators required.

The last group is the SAF. Automated forces are not included because their totals are unimportant. Anything that does not show up in one of the other modes will be represented in BBS or JANUS.

Before making a final cut at the requirements, it will be useful to look next at the technical capabilities that are available to meet these requirements.

SUMMARY OF EXERCISE REQUIREMENTS

18 FEB 94

BDE WK3

			APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-TLIF	LT-T	ME-	MOR	TAN	VTR	WREDI	TOT
SIMULATORS																	
A	ARM	-ATK	32	32				5		4	21	1		53	3	37	188
B	ARM	-MTC	22	32				7		9	27	3		53			153
C	ARM	- DEF	32	32			1	4		4	13	1		57		28	172
D	BDE	CFX	37	10				4		4	4			11		52	122
E	INF	- ATK	31	56				4		4	25			23		42	185
F	INF	- MTC	31	62				4		4	27			23			151
G	INF	- DEF	37	46				4		4	25			17		38	171
		MAX	**37**	**62**			**1**	**7**		**9**	**27**	**3**		**57**	**3**	**52**	**258**
UNASSIGNED																	
A	ARM	-ATK	40					3									43
B	ARM	-MTC	3								1			2			6
C	ARM	- DEF	6				1										7
D	BDE	CFX										1					1
E	INF	- ATK	34								6						40
F	INF	- MTC	34														34
G	INF	- DEF	31								5						36
		MAX	**40**				**1**	**3**			**6**	**1**		**2**			**53**
SAF																	
A	ARM	-ATK	8			4		8	8	27	1	5	8	6	6	5		86
B	ARM	-MTC	29		4	4	1	17	8	19		13	4	6	9	8	2	124
C	ARM	- DEF	19		4	4		16	4	20	6	6		6	2	5	2	94
D	BDE	CFX	32	70		4	1	13		12		6			62	7		207
E	INF	- ATK	10	6		4		21	8	20	1			6	6	8		90
F	INF	- MTC	10			4		21	8	20	1	5		6	6	8		89
G	INF	- DEF	10	6		4		21	8	20	1			6	6	8		90
		MAX	**32**	**70**	**4**	**4**	**1**	**21**	**8**	**27**	**6**	**13**	**8**	**6**	**62**	**8**	**2**	**272**

SIMULATOR TAXONOMY

Two attributes of simulators relevant to this analysis are reconfigurability and fidelity. Before continuing it will be useful to define these terms. Reconfigurability means simply that a simulator can be changed from a representation of one type of vehicle to another. There are two relevant aspects of reconfigurability. First, is the *Ease* with which a change can be made. A highly sophisticated machine could conceivably have a switch that instantly changes the configuration, say from a tank to an APC. On the other end of the spectrum a less sophisticated simulator might require physical reconstruction that takes days or even months.

The *Span* of reconfiguration deals with the number of different kinds of vehicles that a single module can support. A typical SIMNET simulator has a span of one. However, some brute force (with a chainsaw) work has been known to increase the span to two. A simple work station using a keyboard and joystick for controls could conceivable be reconfigurable to hundreds of variations.

Closely associated with these concepts is the attribute of fidelity. It has three aspects—Image, Form & Fit, and Behavior.

Image fidelity refers to the view of the virtual world as seen from the simulator. On the low end this can be a set of military symbols moving on a plan view display. On the high end of the spectrum, one might find a three-dimensional photographic out the window view (in a few years).

Form & Fit fidelity is a function of the man-machine interface of the simulator. The very expensive Air Force flight simulators are a near-perfect replication of the actual cockpit. The Army's Conduct of Fire Simulator (COFT) is also at the high-end of the spectrum. We refer to these high-end simulators as "replicabs." On the low end are computers operated by keyboards and joysticks that have no correlation to the actual controls of the represented vehicle. We refer to these low-end simulators as *pods*.

Behavior fidelity refers to the way the simulated entity performs in the virtual world. This has little to do with the hardware of the simulator, but a lot to do with its software. On the high end are entities that have very realistic appearance and move in very realistic fashion. For example, they would have accurate acceleration dynamics and they would tilt with the terrain as they travel. It would even have inherent intelligence to decide the better route to its objective. On the low end of the spectrum are entities with stylized behaviors that simply sit on the terrain only to disappear and reappear at some new location, as is the case with the maintenance vehicles in SIMNET.

A simulator can be defined by picking the appropriate spot on each spectrum. This approach is useful in discussing differences among simulators and was found to be an effective way of dealing with the different simulator needs of the Virtual Brigade.

IDA

SIMULATOR TAXONOMY

ATTRIBUTES / SPECTRUM	RECONFIGURABILITY		FIDELITY		
	EASE	SPAN	IMAGE	FORM & FIT	BEHAVIOR
HIGH	MINUTES	MANY PLATFORMS	PHOTOGRAPHIC	CAB REPLICA	MAXIMUM BEHAVIORAL ATTRIBUTES
	Reconfiguration by electrical switch, data edit, cab replacement, software module replacement, brute force	Platform specific, wheeled or track specific, ground or air specific, platform independent	Number of polygons, refresh rate, aperture size, field of vision, number of eye points, diurnal/weather effects, IR, thermal	Switchology, spatial relations, appearance, motion, sound	Position, speed, direction, lethality, survivability, algorithms, environmental interaction, intelligent behavior
LOW	MONTHS	ONE PLATFORM	ICONIC	COMPUTER WORKSTATION	MINIMUM BEHAVIORAL ATTRIBUTES

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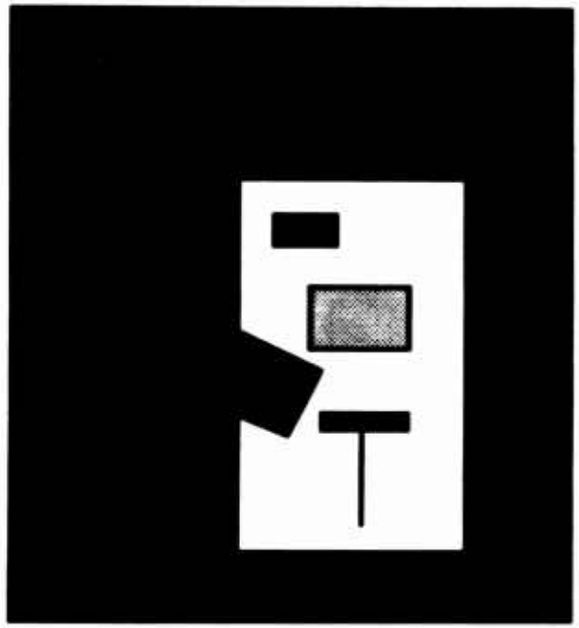
REPLICAB

The next four charts define the major types of simulator.

The replicab is a high Form & Fit fidelity simulator. It supports the interactions of a crew that fights the vehicle on the battlefield. It has the right switches, knobs, and dials to force the crew to perform the same ergonomic functions they would have to perform on their actual vehicle. Replicabs can be reconfigured to a few different vehicle variations, but the reconfiguration process is measured in hours because hardware must be changed. (A much more rapidly reconfigurable replicab is conceivable, with a sufficient investment in duplicate hardware.)

IDA

REPLICAB



1. DYNAMIC PRESENCE ON THE BATTLEFIELD.
2. RADIO PRESENCE ON THE BATTLEFIELD
3. HI FORM-FIT FIDELITY
4. ACTUAL CONTROLS.
5. ONE REPLICAB CAN REPRESENT 1-TO-4 DIFFERENT VEHICLES.
6. ENGINEER RECONFIGURED IN LESS THAN 8 HOURS.
7. CREW INTERACTIONS SUPPORTED.

RECONFIGURABLE POD

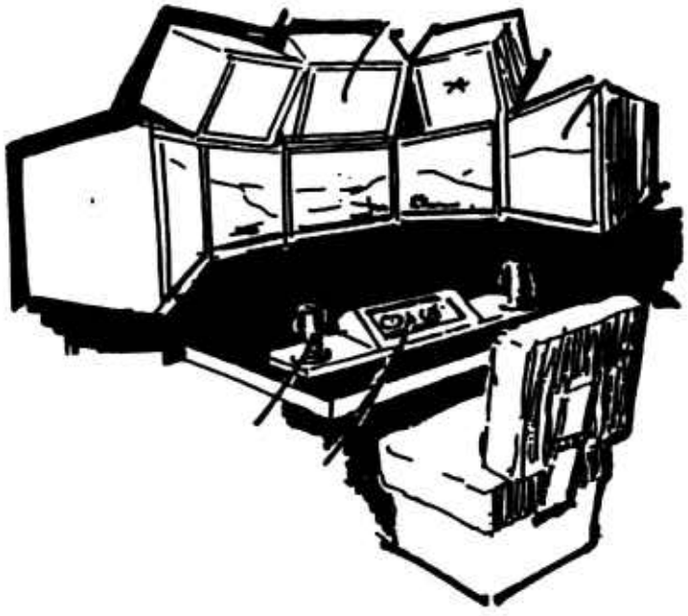
Reconfigurable pods are workstations that provide an out-the-window view of the virtual battlefield but have no Form & Fit fidelity. Because they do not have specific controls and dimensions, they can be reconfigured in software instead of hardware in a matter of minutes or seconds. Reconfigurable pods provide an operator with dynamic presence on the battlefield and with oral communication with other command and control entities.

The concept of a pod is to use a low-cost image generator with only one optical channel. With this approach, Ft. Knox could afford a large number of simulators for the expense of a few replicabs.

Some simulators have been built that have more Form & Fit fidelity than a pod but less that of a replicab. Such simulators would tend to contaminate the skills of a soldier trained on an actual vehicle, thus inducing negative training. This type of simulator was not considered appropriate for use in the Virtual Brigade.

IDA

RECONFIGURABLE POD



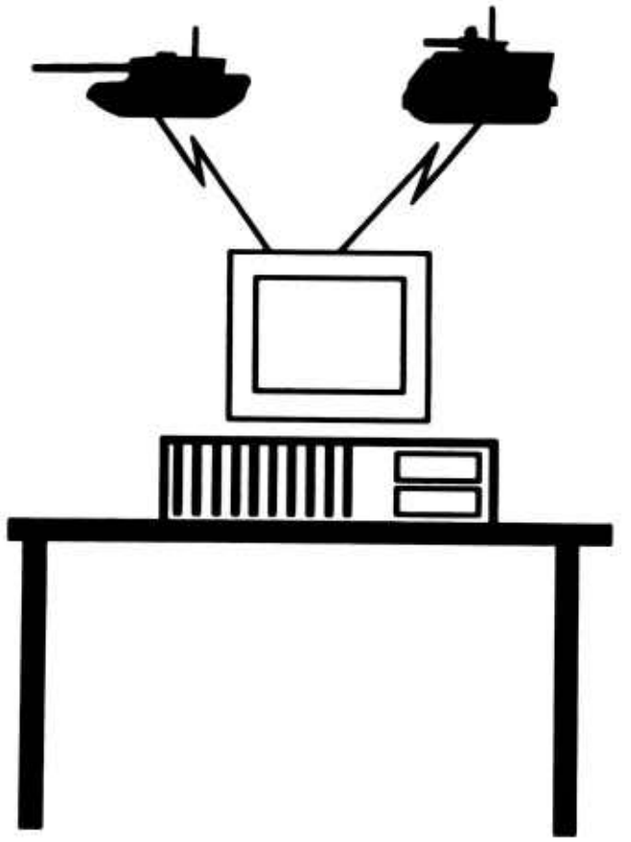
1. DYNAMIC PRESENCE ON THE BATTLEFIELD.
2. RADIO PRESENCE ON THE BATTLEFIELD.
3. NO FORM-FIT FIDELITY.
4. JOYSTICK AND TOUCH SCREEN CONTROL.
5. ONE POD CAN REPRESENT MANY DIFFERENT VEHICLES.
6. BATTLE MASTER RECONFIGURED (LESS THAN 1 MINUTE.)
7. NO CREW INTERACTIONS

SEMI-AUTOMATED FORCES

Semi-automated forces (SAF) are software-driven entities managed from a workstation that controls many entities. They are maneuvered and operated by software that determines what they should do and when they should do it. The operator at the workstation can allow them to continue autonomously or can intervene whenever necessary to do something other than what the software would determine. SAF have varying degrees of inherent intelligence. In SAF the operator has the ability to assume control of individual vehicles.

IDA

SEMI-AUTOMATED FORCES



1. DYNAMIC PRESENCE ON THE BATTLEFIELD.
2. ENTITY RADIO PRESENCE SIMULATED BY DIGITAL DATA.
3. NO FORM-FIT FIDELITY.
4. POSITIVE ENTITY CONTROL BY MOUSE & KEYBOARD.
5. ONE TERMINAL CAN MANAGE NUMEROUS VEHICLES AND VEHICLE TYPES.
6. NO CREW INTERACTIONS REQUIRED.

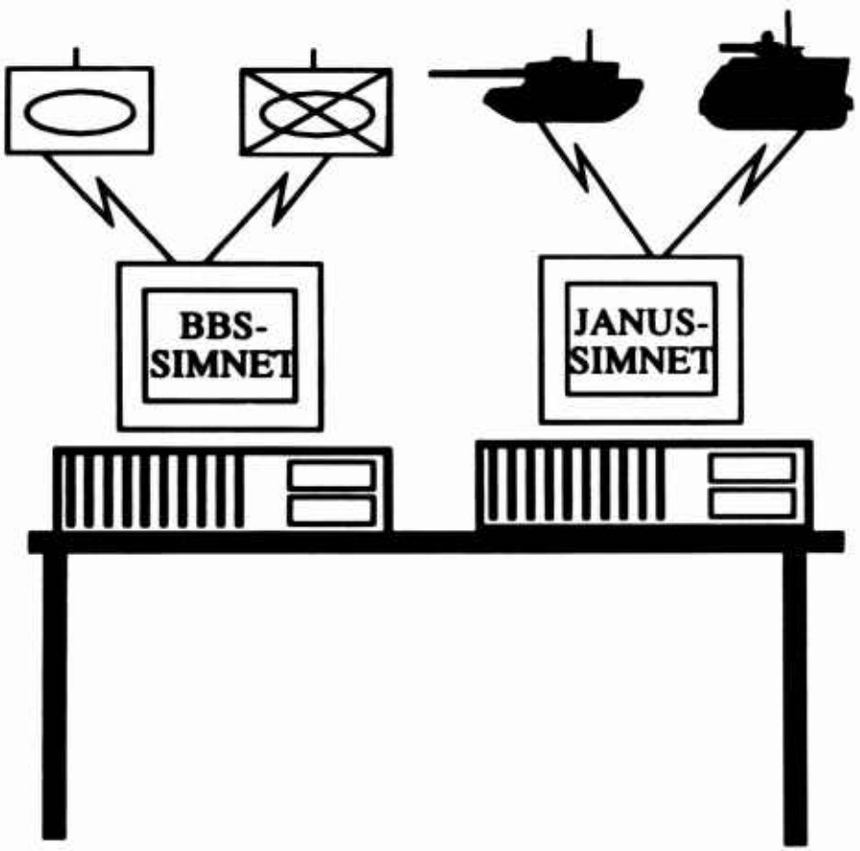
AUTOMATED FORCES

Automated forces are a class of simulations (constructive models) that have been adapted to operate on the virtual battlefield. Automated Interface Units (AIU) are being developed for both BBS and JANUS which will permit the simulation to control SIMNET SAF entities in lieu of a SAF operator. In these cases the commander and staff of a brigade or battalion can instruct forces to move via BBS and have those forces interact with manned SIMNET simulators. These automated forces differ from normal SAF in that the operator loses the ability to intervene and control the behavior of an individual vehicle.

Work is in progress on developing SIMNET interfaces for these two models. The BBS-SIMNET interface has been demonstrated, but the JANUS-SIMNET remains a developmental item. Work on both of these models could be accelerated with proper emphasis and funds.

IDA

AUTOMATED FORCES



1. DYNAMIC PRESENCE ON THE BATTLEFIELD.
2. ENTITY RADIO PRESENCE NOT SUPPORTED.
3. NO FORM-FIT FIDELITY.
4. ONE SUITE OF WORK-STATIONS CAN REPRESENT A BATTALION OR BRIGADE.
5. NO CREW INTERACTIONS.
6. LINKS TO SIMNET ARE EVOLVING.

SIMULATION ALLOCATION CRITERIA

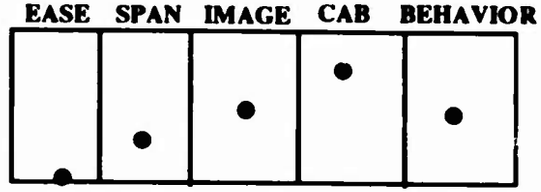
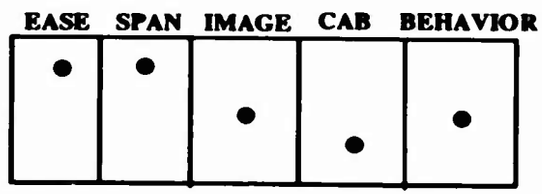
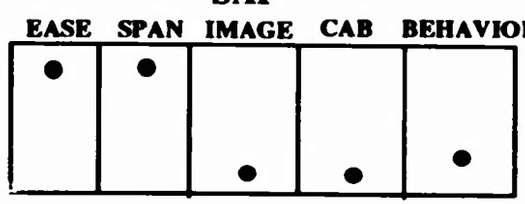
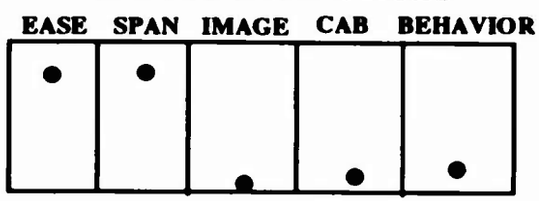
This chart summarizes the discussion on the preceding series of charts. It shows the profile of an example of each type of simulator.

The column labeled "Decision Criteria" is the basis for determining how a specific TO&E platform could be simulated in the Virtual Brigade to achieve the objectives of specific training events.

The column labeled "Platform Attributes" shows the profiles of the examples listed to the right.

IDA

SIMULATOR ALLOCATION CRITERIA

DECISION CRITERIA	PLATFORM ATTRIBUTES	EXAMPLES
■ CREW FIGHTS THE VEHICLE ■ RADIO PRESENCE ■ DYNAMIC PRESENCE *	**REPLICAB** EASE SPAN IMAGE CAB BEHAVIOR 	SIMNET - M1
☐ CREW FIGHTS THE VEHICLE ■ RADIO PRESENCE ■ DYNAMIC PRESENCE *	**POD** EASE SPAN IMAGE CAB BEHAVIOR 	SUN WITH JOYSTICK
☐ CREW FIGHTS THE VEHICLE ☐ RADIO PRESENCE ■ DYNAMIC PRESENCE *	**SAF** EASE SPAN IMAGE CAB BEHAVIOR 	SIMNET SAF
☐ CREW FIGHTS THE VEHICLE ☐ RADIO PRESENCE ■ DYNAMIC PRESENCE *	**AUTOMATEDFORCES** EASE SPAN IMAGE CAB BEHAVIOR 	BBS - SIMNET JANUS - SIMNET

* = Ability to see, be seen, traverse, and be vulnerable on the battlefield

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INDUSTRY SURVEY

In our survey of industry to determine the technologies available for use in the Virtual Brigade, the team queried a broad spectrum of vendors. All provided some marketing information. Some were more responsive than others. Questionnaires were sent to all asking that they describe their systems. Their answers will be collected in a database that will serve as a catalogue for the simulation community. This effort transcends the time frame of the QLT. The purpose of this chart is to show that there are a lot of programs and vendors involved in efforts related to the VBTP.

The acronyms under the other Government Programs heading mean:

A2ATD	Anti-Armor Advanced Technology Demonstration
ARSI	ARPA Reconfigurable Simulator Initiative
ATD-1	Advanced Technology Demonstration #1
STOW	Synthetic Theater of War
CATT	Combined Arms Tactical Trainer
CCTT	Close Combat Tactical Trainer
GUARDFIST	Guard Unit Armory Device - Full Crew Simulation Trainer
RCVTP	Reserve Component Virtual Training Program
TARDEC	Tank and Automotive Research, Design and Experiment Command
VSF	Vetronics Simulation Facility
TWGSS	Tank Weapons Gunnery Simulation System
PGS	Precision Gunnery System

IDA

INDUSTRY SURVEY

- LOTS OF PLAYERS WITH DIFFERENT SPECIALTIES
- MARKETING INFORMATION ABOUNDS
- CATALOGUE OF PRODUCTS & PROGRAMS TBP

CIGs

Bail
BBN
CAE Electronics
Division, Inc.
Evans & Sutherland
FlightSafety Int.
Fujitsu Systems
Hitachi
IVEX Corp.
Link-Miles
Loral-ADS
Martin Marietta
Silicon Graphics
STAR Technologies
Tellurian
Thomson-CSF
XTAR Electronics, Inc.

Systems

Armstrong Labs
Boeing
CAE-Link Corp.
Chameleon Technologies
Coleman Research Corp.
Contraves USA
Division
ECC International
Eidetics
Elbit Systems of America
Emerson Electrc Co.
Grumman Aerospace
IBM Federal Systesms
IDL
Lockheed
Loral
Martin Marietta
Perceptronics
Reflectone
Rockwell International
Saab Training Systems
SBS Engineering
Texas Instruments
TRW
Unisys Corp.
VEDA

Hardware

Encore Computer Corp.
Harris Computer Systems
Motorola
Silicon Graphics

Software

Computer Sciences Corp.
Concurrent Computer Corp.
Lockheed
Loral
MaK Technologies
Motorola
Raytheon
SAIC
Unisys Corp.
Virtual Prototypes

Government Programs

A2ATD
ARSI
ATD-1 - STOW
CATT/CCTT
DIAL-A-TANK
GUARDFIST
RCVTB
TARDEC, VSF
TWGSS/PGS

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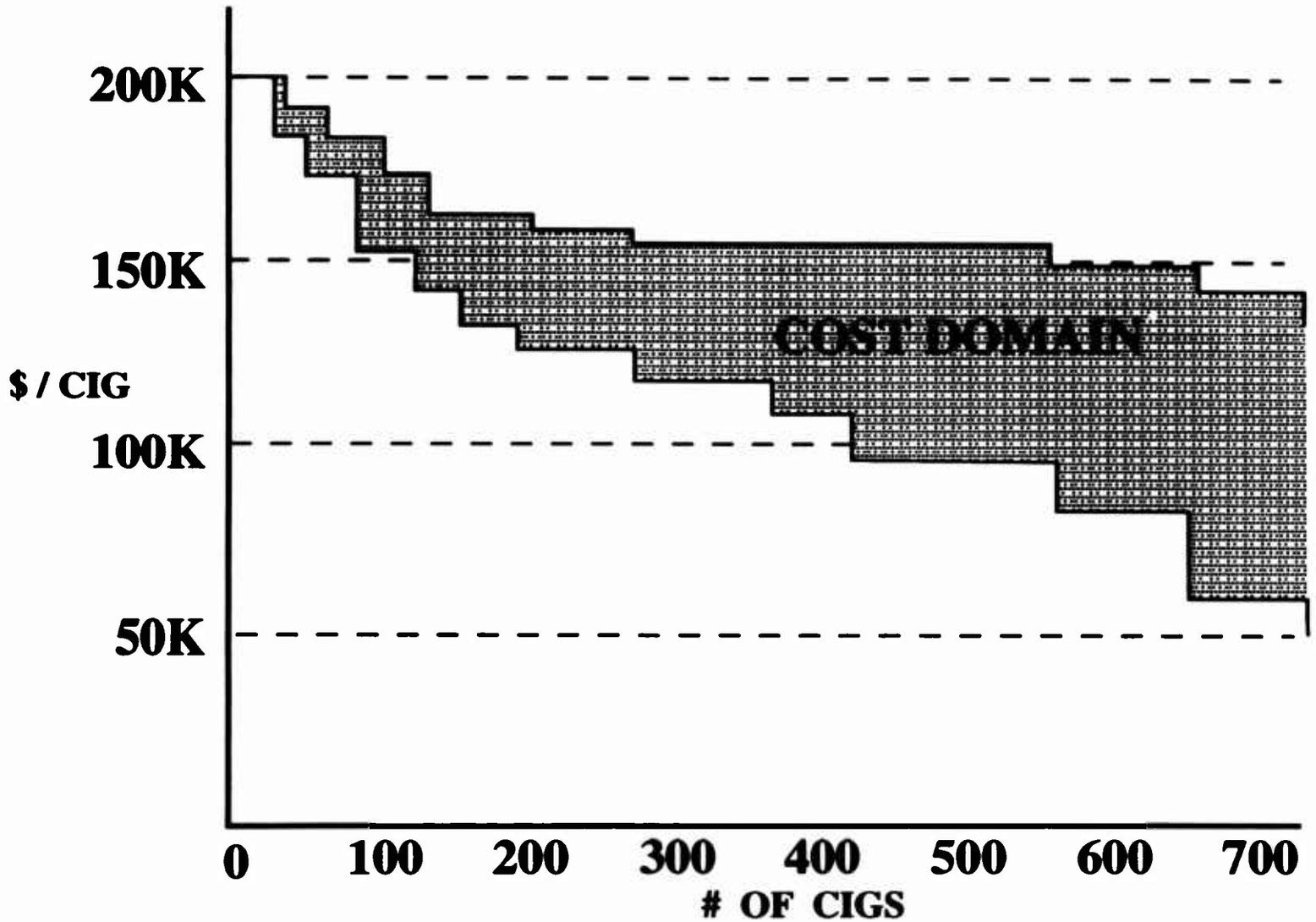
GENERAL EFFECTS OF QUANTITY BUYS

A critical issue of the Training Requirements Analysis is the evaluation of the Computer Image Generator (CIG) requirements. The technical aspects of this issue as determined from the industry survey are summarized in this next series of charts. The team looked at CIGs in the $150K to $200K realm.

The effects of "Quantity Buying" are significant. Our expectation of this phenomenon going into this study is characterized by the upper boundary of the shaded area in this chart. However, we found the lower boundary to be characteristic of industry marketing information. The truth, which cannot be determined until a contract is negotiated, probably lies somewhere in the shaded area. Whatever the real answer, buying in quantity is bound to be good for the program.

IDA

GENERAL EFFECT OF QUANTITY BUYS



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TERRAIN RENDERING

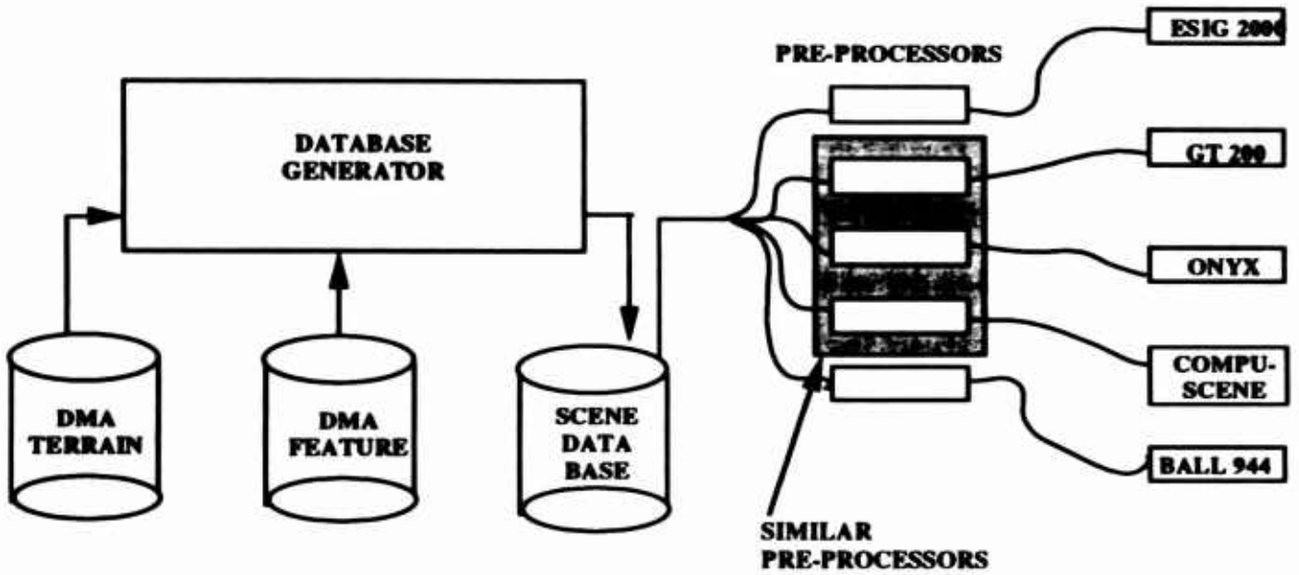
The technology for rendering terrain in a CIG requires combining actual terrain data (elevations and distances) and feature data (houses and telephone poles) into a digital scene database containing all of this information. These data are then "pre-processed" into a unique format for a specific CIG. The pre-processors are unique to each CIG and the resulting application terrain database is therefore unique as well.

The process for terrain database generation for three CIGs (GT200, ONYX, and Compuscene) is very similar and produces simulated terrain that can be expected to correlate well. The ESIG 2000 and the Ball 944 differ from the other three and have greater potential to render the terrain differently. The degree of difference is not known. In the best case the difference would be trivial and not noticeable by soldier training on the system. In the worst case vehicles properly registered on the ground in one simulator would occasionally float above the terrain (or burrow in) as seen from another simulator.

We do not know how serious this problem is, but it is clearly worth requiring the vendors who supply simulators to demonstrate their system interacting with other systems. Their terrain rendering should be compatible with the existing SIMNET simulators (of which there will be about 90). If not, serious training distracters could develop.

IDA

TERRAIN RENDERING



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COMPUTER IMAGE GENERATOR COMPARISIONS ($150K - $200K)

This chart summarizes the findings of our CIG investigations.

The Brigade can either purchase CIGs directly from a manufacturer and have them configured (including software) by a third party, or it can purchase a finished product (with CIG embedded) from a systems house. Buying directly from a manufacturer, the only CIG that could generate significant DISCOUNT BUY advantages is the ESIG 2000 which is being used on both the CCTT and GUARDFIST programs. The numbers of CIGs being purchased, according to our estimates, could generate savings of 50 percent or more. No other programs are large enough to generate these savings. However, system houses like CSC, Loral, and TI buy CIGs in sufficient quantity to generate significant discounts. Buying a finished simulator from a large system house generates the advantages of discount buying and turnkey operations.

Ground combat APPLICATION EXPERTISE is important to the CIG decision because there are so many entities that need to be represented and the software development times are long. The GT200's predecessors have been used extensively in the SIMNET world and Loral has the experience to support rapid development of new requirements. Evans & Sutherland is newer in the ground combat business, but is building expertise. Silicon Graphics provides no SIMNET capability. Other vendors, e.g., Texas Instruments and Loral, are developing the capability to support Silicon Graphics CIGs. There needs to be a "show me" session to determine what is lost in gaining sufficiently high numbers of moving models to support ground combat training.

The 194th Brigade needs to start training about 10 months before its NTC in May 1996. An operational training capability is needed, therefore, by August 1995. Given this schedule, the ability to develop the simulation quickly becomes very important which gives weight to the GT200. If the NTC rotation were to slip a year or so, quantity buys and compatibility with CCTT become more important drivers in the equation and the ESIG 2000 gets more weight.

As discussed earlier, TERRAIN RENDERING is not a determining factor but should be watched carefully.

IMAGE QUALITY is comparable among the three leading candidate CIGs. Of the considerations listed here, it is probably the least important, because the Virtual Brigade will have a baseline of SIMNET simulators that will be operating at the low end of the quality spectrum until they are replaced by CCTT.

PRIMARY IMAGE DOMAIN refers to the historical application of the CIG. The ESIG 2000 evolved from the Air-to-Air and Air-to-Ground simulation environment. Its architecture for managing the scene is optimized for these applications and must be adapted to the ground combat world. The GT200 is a product of the ground combat world and better postured to meet the Virtual Brigade requirements. The ONYX is more of a general purpose CIG and is better adapted to the task of switching from CAD/CAM to training applications.

VBTP APPLICATION is our assessment of how these CIGs fit into the program. Whether the ESIG 2000 or the GT200 offers the best value depends on programmatic issues. Either will meet the requirement.

IDA

COMPUTER IMAGE GENERATOR COMPARISIONS ($150-$200)

CONSIDERATIONS / CIGs	DISCOUNT BUY	GROUND APPLICATION EXPERTISE	COMMON TERRAIN RENDERING	IMAGE QUALITY	PRIMARY* IMAGE DOMAIN	VBTP APPLICATION
ESIG 2000	CCTT GUARDFIST			CCTT	AIR-AIR AIR-GROUND	REPLICAB
LORAL GT200		EXTENSIVE	MORE	CCTT	GROUND	REPLICAB OR POD
SGI ONYX		NEW & BUILDING @	MORE	CCTT		POD

* = BASED ON NUMBER OF MOVING MODELS AND NEED FOR OCCULTING IN DEPTH.

■ = LESS DESIRABLE.

@ = BECOMES LESS OF A DISCRIMINATOR OVER TIME DUE TO CCTT EXPERIENCE..

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VB34

SIMULATOR SOURCES

With respect to pods, assuming for now the importance of rapidly developing a capability to meet a May 1996 NTC rotation, the ARSI program's reconfigurable simulator (built by Texas Instruments and based on a Silicon Graphics CIG) is by far the best choice for constructing the rapidly reconfigurable pod. Their system was designed to be quickly reconfigured by software and more slowly reconfigured by swapping in and out the control devices of the vehicle being simulated. All that is required to convert the ARSI simulator to use as a pod is the replacement of high fidelity controls with a joy stick. There will be a significant effort to develop tables of vehicle parameters for HMMWV, ACE, VTR, etc. ARSI is close to providing the necessary basic capability. Development times for the remainder of the capabilities would be shorter than any other approach.

Three cases of replicabs need to be addressed.

1. The existing Ft. Knox SIMNET simulators should continue in their current configuration. The only modifications necessary are adapting them to use digital technology (see second chart following) and upgrading the tactical communications.

2. The 14 simulators returning from Europe should be reconfigured for operational, not technical, reasons, as will be discussed later. The rebuild of these simulators is technically feasible. It has been done in the past and new technologies make it even simpler. The concept should be to reuse the "guts" of the simulator and build new cabs.

3. New replicabs will be required to meet the training requirement. These replicabs will need new CIGs, computers, monitors and cabs.

   a. A major task that must be started quickly is specification of the functionality required in these simulators. The builder/integrator will need specific guidance on what the simulators will be expected to do. This is a complex task and approval of the specification can be expected to take a long time.

   b. Selection of CIGs for these simulators drives the design. Loral is in the best position to provide replicabs with GT200 CIGs. Loral has extensive experience in the development of ground combat based simulators. A physical manifestation of this experience is off-the-shelf software that can be used, or modified for use, to build fixed or reconfigurable replicabs. The GT200 architecture, derived from the GT100 and SIMNET CIG, is oriented to the ground combat role with occulting in depth and a high number of moving models.

IDA

SIMULATION SOURCES

PODS

USE ARSI SIMULATORS AS THE BASE.

SGI ONYX CIGs.

RAPIDLY RECONFIGURABLE.

ELIMINATE ALL CONTROLS, EXCEPT FOR TOUCH SCREEN AND JOYSTICK.

DEVELOP REQUIREMENT TO DEFINE CONFIGURATIONS (FUNCTIONALITY)

SPECIFICATIONS ?????

REPLICABS

EXISTING FT KNOX SIMULATORS

MAINTAIN CURRENT CONFIGURATION

ADAPT FOR DIGITAL TECHNOLOGIES

UPGRADE COMMUNICATION

RETURNING EUROPE SIMULATORS

RECONFIGURATION IS QUITE FEASIBLE

REUSE THE "GUTS"

BUILD NEW CABS

ADAPT FOR DIGITAL TECHNOLOGIES

NEW REPLICABS

BUY ES2000 OR GT200

BUILD NEW CABS

ADAPT TO DIGITAL TECHNOLOGIES

SPECIFICATIONS ?????

SIMULATOR SOURCES (continued)

If the Brigade's NTC rotation is delayed, then other factors assume greater prominence in the equation. If the rotation is delayed long enough to allow the CCTT contractors to develop a software base for the ESIG 2000 equivalent to the software base for the GT200, then the extremely high discount rates associated with CCTT's large buy make the ESIG 2000 very attractive. In addition, piggybacking on CCTT assures compatibility with the equipment that will eventually replace SIMNET in the Virtual Brigade.

The significance of the price difference between GT200 and ESIG 2000 can only be determined at the time the Army negotiates prices with the vendors. The price difference in CIG hardware may be overshadowed by the cost of software development necessary to make a replicab perform properly. The cost of the crew compartment is assumed to be constant and independent of the CIG and software costs. Software development costs money, but perhaps more importantly, takes time. Depending on the date of the NTC rotation, software development time may be prohibitive and the Army would be best served by the CIG with the most off-the-shelf software.

IDA

SIMULATION SOURCES

PODS

USE ARSI SIMULATORS AS THE BASE.

SGI ONYX CIGs.

RAPIDLY RECONFIGURABLE.

ELIMINATE ALL CONTROLS, EXCEPT FOR TOUCH SCREEN AND JOYSTICK.

DEVELOP REQUIREMENT TO DEFINE CONFIGURATIONS (FUNCTIONALITY)

SPECIFICATIONS ?????

REPLICABS

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MAINTAIN CURRENT CONFIGURATION

ADAPT FOR DIGITAL TECHNOLOGIES

UPGRADE COMMUNICATION

RETURNING EUROPE SIMULATORS

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BUILD NEW CABS

ADAPT FOR DIGITAL TECHNOLOGIES

NEW REPLICABS

BUY ES2000 OR GT200

BUILD NEW CABS

ADAPT TO DIGITAL TECHNOLOGIES

SPECIFICATIONS ?????

CAN EUROPEAN SIMNET SIMULATORS BE RECONFIGURED?

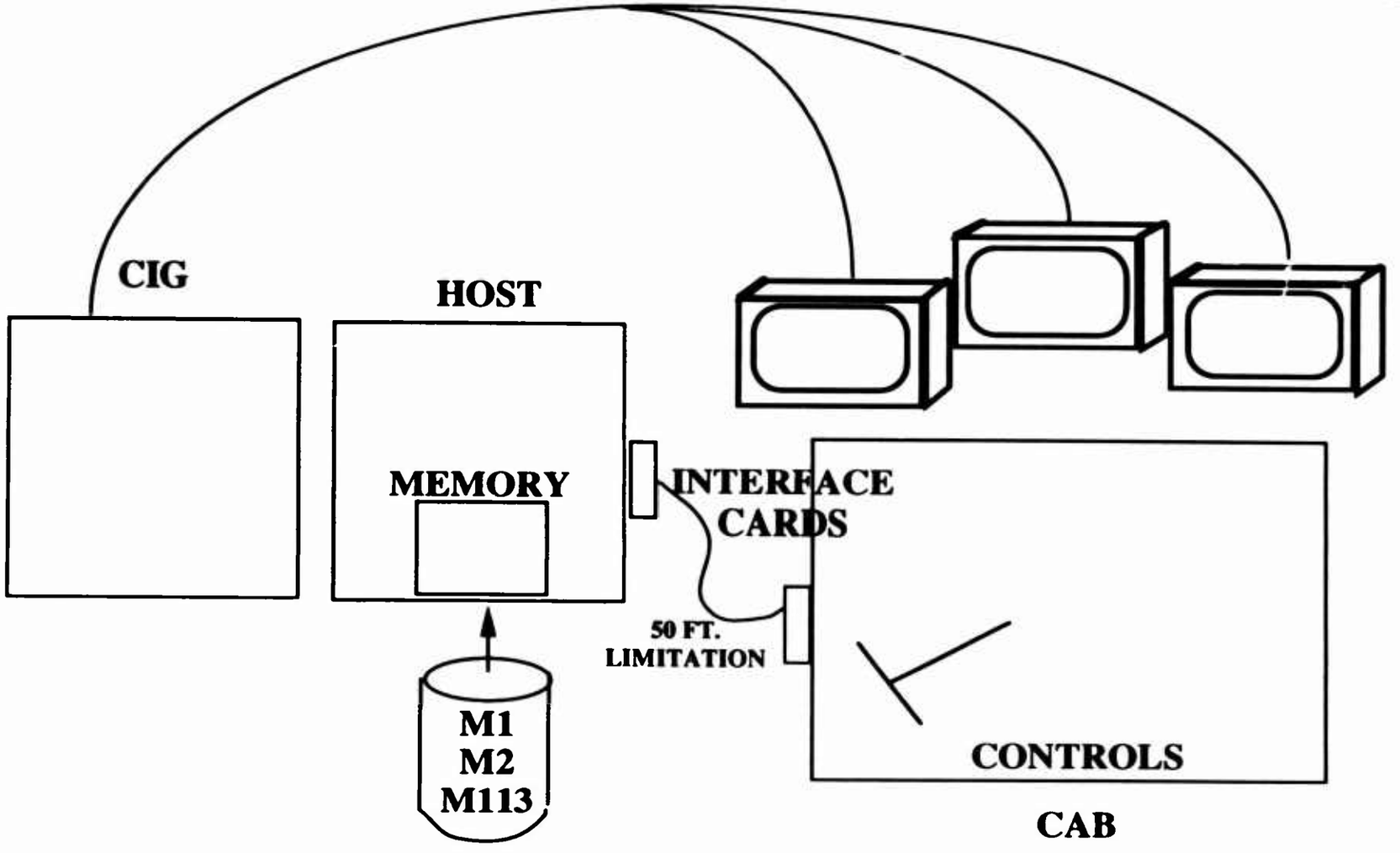
The answer is yes. SIMNET simulators have been reconfigured in the past. There are no technical aspects that would prevent it. Using the host computer and the CIG as a base, the monitors could be rearranged, their vision points could be redefined, and the data that defines the simulator's behavior could be replaced with new data. New cabs could be built and attached to the base to represent several different configurations. As long as the cabs can remain within 50 feet of the base (a limit on the cord length), any one of the several cabs could be activated at a time.

Switching configurations would probably take on the order of an hour. This depends on how the interfaces are designed. For example, if each cab had its own dedicated monitors (i.e., buy more monitors), then the existing monitors would not have to be moved from one cab to another each time the configuration changes. Smart engineering will help, but money will help even more.

The more challenging aspect of rebuilding these simulators is in the definition of the functionality that the new configurations must represent. In a subsequent chart we will propose that these 14 simulators be rebuilt as M113/ITV simulators. If this approach is approved, someone will have to write the code and collect the data for these vehicles. Before that, the Army will have to describe what it wants the simulators to do. One old soldier, who has fought these battles before, considers this a non-trivial exercise.

IDA

CAN EUROPEAN SIMNET SIMULATORS BE RECONFIGURED?



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DIGITAL BATTLEFIELD TRAINING CONCEPT

One more type of building block is necessary to build the Virtual Brigade. Training in the use of Digital Battlefield technology requires a means of reconfiguring simulators to incorporate any of a variety of digital components.

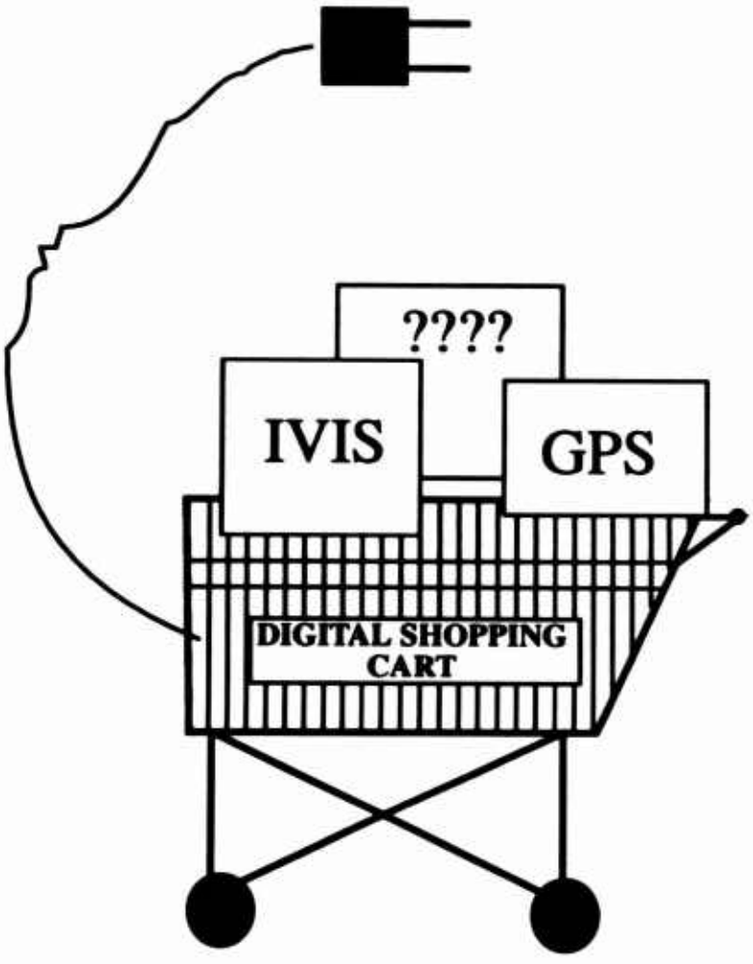
We propose a portable tool kit, "the digital shopping cart," that can be stationed next to a replicab or pod and connected to bring in the appropriate functionality. The design of such a cart is not postulated by the QLT. We simply acknowledge that something like this is necessary. It should be able to connect to any simulator. There should be enough of them to satisfy the number of simultaneous users. Each one should have the capability to represent all of the necessary digital devices on a dial up basis. Also, the functionality should be software dependent (versus hardware) so that it can be adapted to new developments in digital technology.

The tool kit must come with instructions on how to use the functionality it represents. A built-in training system would seem to be essential so that a crew in a simulator can quickly learn how to operate the new system, before participating in collective activities.

A study needs to be conducted to determine how to bring the digital world into existing M1 and M2 simulators. All new replicabs and pods need to be designed with digital capabilities in mind. Similarly, digital capabilities need to be added to SAF in a manner that permits them to be added or withdrawn on demand.

IDA

DIGITAL BATTLEFIELD TRAINING CONCEPT



* PORTABLE TOOLKIT
* PLUG IN TO ANY SIMULATOR
* INSTALLED BY BATTLE MASTER
* DIAL UP FUNCTIONALITY
* ADAPTABLE TO FUTURE DIGITAL DEVELOPMENTS
* MUST INCLUDE A TRAIN-UP PACKAGE FOR NEW USERS

PROPOSED FACILITIES CONCEPT

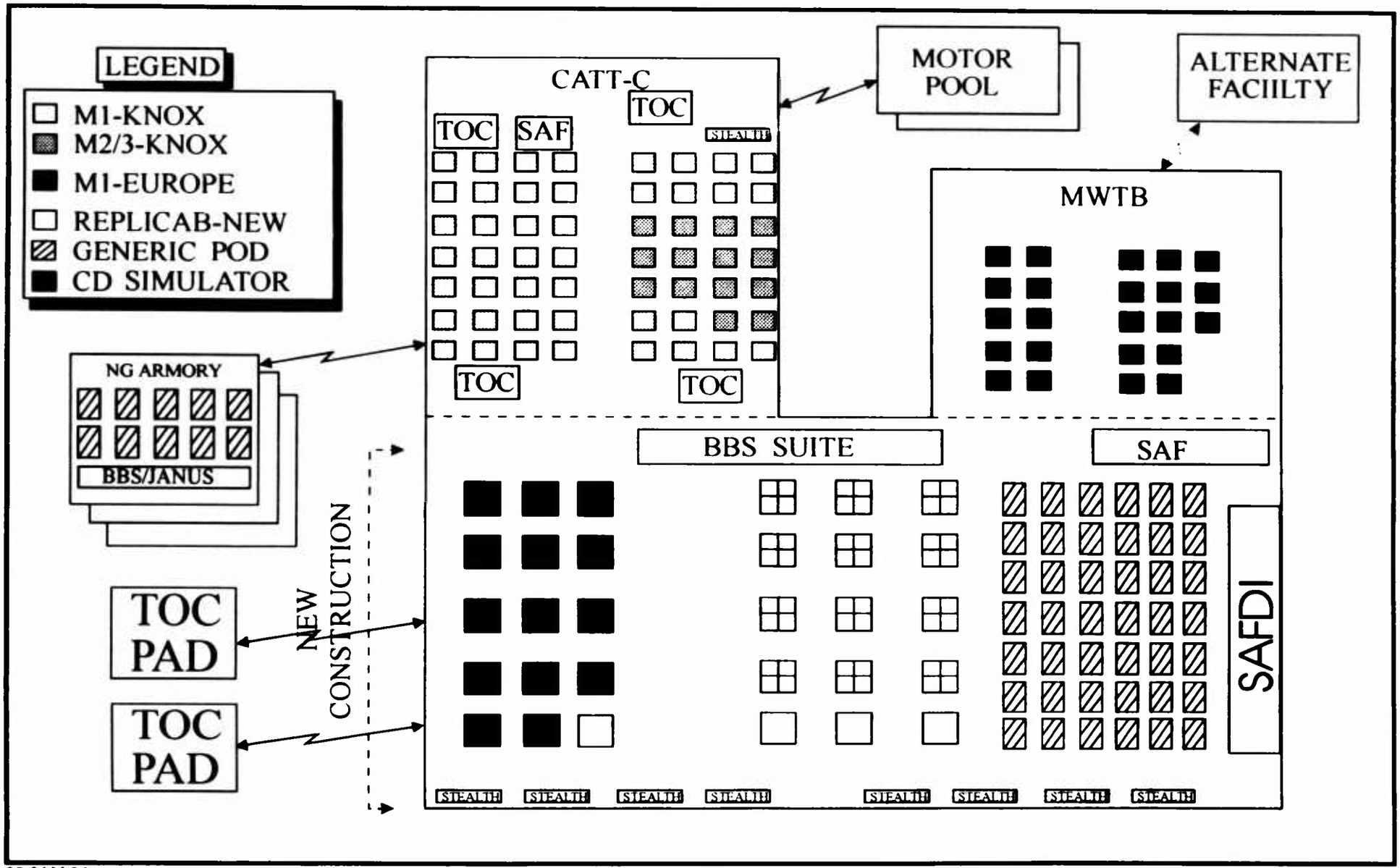
Our notion of what the Virtual Brigade training facility might look like is based on the two existing SIMNET facilities at Ft. Knox. The CATT-C (SIMNET-T) facility houses 56 SIMNET simulators (42 M1 tank, 16 M2 BFV). It also has three large TOCs and one small TOC. The Mounted Warfare Test Bed (MWTB) (SIMNET-D) has 18 simulators and a variety of TOCs and workstations.

The facilities concept envisions construction of an addition that approximately doubles the floor space and links the two facilities. The addition would house 14 SIMNET simulators returned from Europe and reconfigured into something else. There would also be some number of new replicabs and some number of reconfigurable PODS. A significant SAF capability and a way of managing dismounted infantry (SAFDI) will also be necessary. The numbers of these items is the subject of the Training Requirements Analysis, and will be discussed in later charts.

It may be useful to put some simulators at the home station of remotely located units. The 2-136 Mech Infantry Bn is located in Wisconsin, the 1-201 Artillery Bn is located in West Virginia, and the headquarters of the support battalion may be located at some other active duty installation (e.g., Ft. Hood). Our concept envisions these units participating in Virtual Brigade training from their home station. As a work-around for the possibility that the new facility addition may not be finished on time, consideration should be given to establishing an alternate facility at Ft. Knox in an existing building. All of these remote facilities would have to be networked and connected to the expanded SIMNET facilities.

IDA

VIRTUAL BRIGADE PROPOSED FACILITIES CONCEPT



VIRTUAL BRIGADE BATTLE MANAGEMENT CONCEPT

A complex facility housing many types of simulators, some of them reconfigurable and serving a training audience with diverse and dynamic training requirements, is no simple management task. The relatively benign environment of SIMNET is managed by a Battle Master and a few technicians. The Virtual Brigade will be a very different environment.

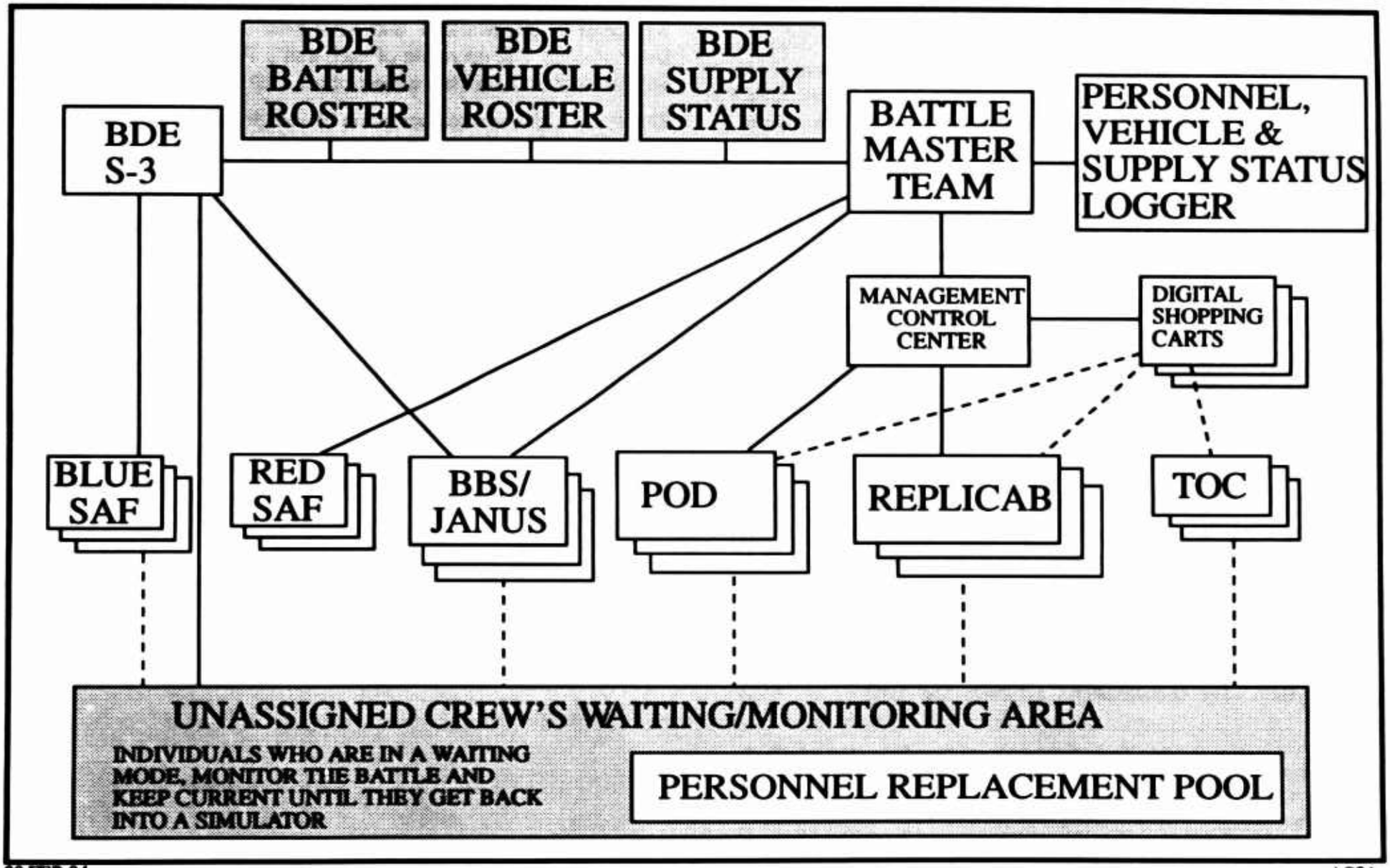
Vehicles that exist in SAF will be handed over to an operator in a pod or a crew in a replicab dynamically during the battle. That means that the Battle Master will have to change the configuration of the simulator and the SAF simultaneously. He will have to coordinate the instant of control hand-off. He will have to ensure that the crew is ready for the hand-off. He will have to convince the current occupant of the simulator to dismount. Idle crews and operators will have to have a place to wait (while keeping up with the progress of the battle) for their next turn in a simulator. The Battle Master must manage the installation and removal of digital capabilities on the simulators. He will also have to control the wide area networking.

The Brigade S-3 (or his representatives) will coordinate the people and resources that participate in a battle. He will determine who participates, with which vehicles. He will also determine when simulator changes are to occur. He will run the BBS/JANUS portion of the battle (with the help of the Battle Master) and he will be directly involved in the management of the SAF.

Between the Brigade S-3 and the Battle Master there is a great deal of work to be done. It must be done in a timely manner so that these activities do not detract from the training exercise. The point of this discussion is that the Battlemaster function for Virtual Brigade is going to require much more effort than is currently necessary in SIMNET. The above discussion only scratches the surface. This topic requires a great deal of serious thought and planning.

IDA

VIRTUAL BRIGADE BATTLE MANAGEMENT CONCEPT



LOGISTICS TRAINING CONCEPT

CSS management is another function that must be embedded into the training. In essence, requirements for supply, maintenance, and replacement of equipment and personnel are generated by all elements involved in the simulation exercise. Each unit utilizes its Field Standard Operating Procedures (SOP) activities to report personnel casualties, equipment damage, and supply requirements which in turn exercise the CSS systems. These systems operate on the availability of personnel, equipment, and supplies as taken from actual unit status at the beginning of the exercise.* Time delays and shortages of personnel, equipment and supplies realistically constrain combat operations and require staff analyses and decisions on the part of commanders at each successive echelon to maximize combat power and minimize constraints. The interaction of Combat, Combat Support and Combat Service Support activities provides fully integrated training and practice for all exercise units and enhances readiness for the entire brigade.

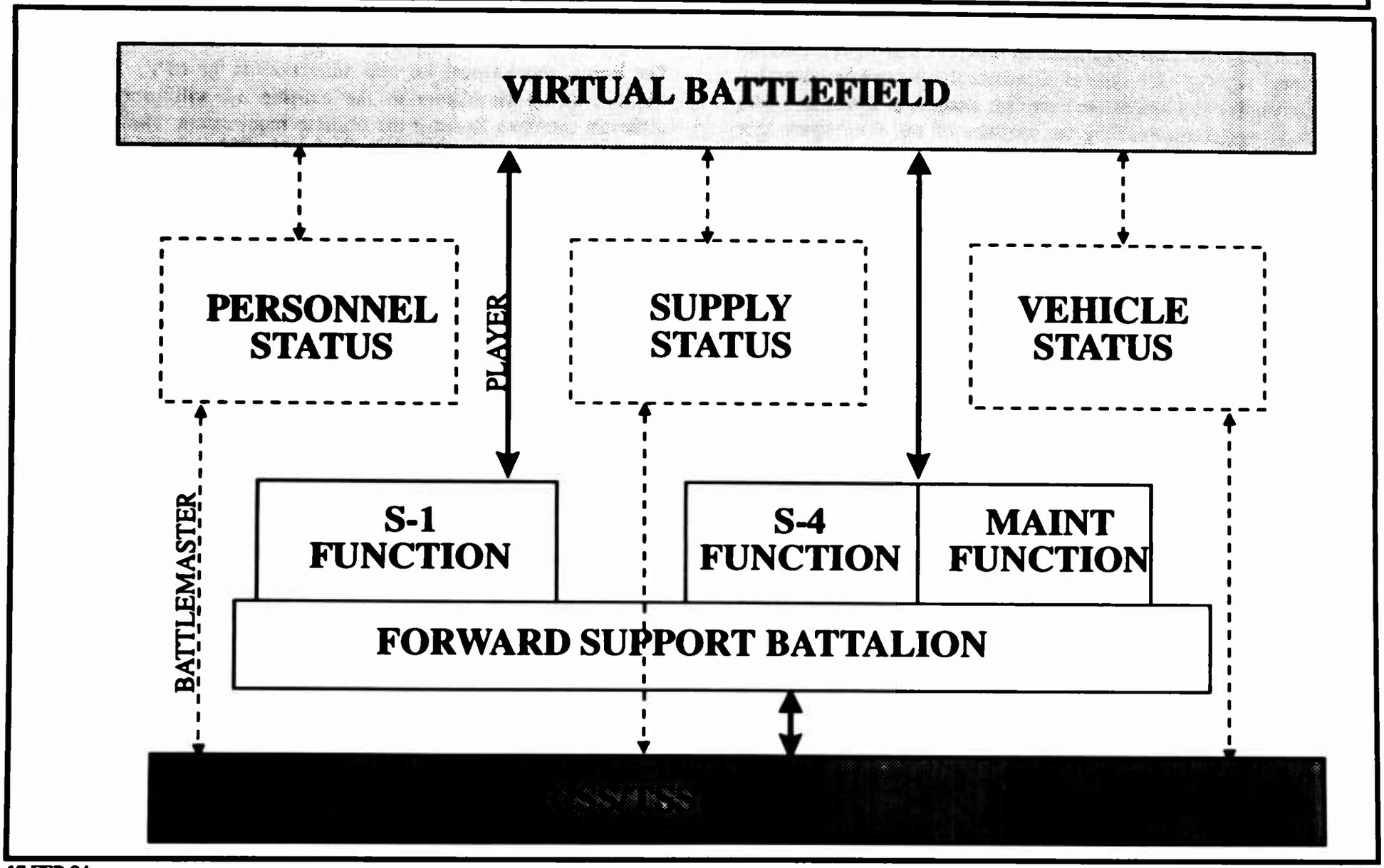
Battle rosters of each exercise unit's actual strength must be provided from the unit's S-1s. Battle casualties must be assessed in the same manner that combat vehicle damage is currently assessed, and the unit must report casualties in accordance with its Field SOP. The Battle Master controls personnel who have been assessed as casualties, and after a designated time delay, integrates them into the replacement system. The Battlemaster's activities are passive, and react only to reports and requirements from the units; however, the simulation system must disable appropriate crew stations until replacements are available and have been assigned on unit battle rosters. The operation of each unit's Personnel Service Support System must be a subject of all AARs.

Supply activities and reconstitution of vehicles and equipment must be similarly managed. Initial stock and vehicle status must be provided by each exercise unit before beginning an exercise from actual records. Requirements are generated by combat activities and the passage of time using actual support system hardware and software programs, in accordance with established SOPs. Support units provide supplies and maintenance in terms of availability and realistic time-delay factors without actually moving supplies or performing maintenance, thereby eliminating logistical constraints and enhancing combat power.

* We propose that the CSS units use a copy of their daily status records as of the day before the exercise. Load it on their systems as the initial condition of the exercise and operate from those records. At the end of the exercise the modified records can then be discarded.

IDA

LOGISTICS TRAINING CONCEPT



RECOMMENDED SIMULATOR MIX

The previous chart showed the results of the TO&E database analysis. That analysis produced numbers that represented the upper limit of each type of simulator that would be necessary to conduct any one of the exercises examined. Those numbers were not constrained by the realities of the floor space that might be available. At this point we encounter a chicken-and-egg type of problem. The floor space requirement cannot be determined until the simulator allocations are known, and the simulators cannot be allocated until the floor size is known. Our way through this problem was to apply some judgment, create a strawman, and then adjust it to a reasonable mix.

That process resulted in the recommended simulator mix shown here. The various simulator platforms are arranged in groups reflecting types of implementation. For example, the first group (M113, M577, and M548) consists of vehicles that could be implemented from the same base simulator. In each of these the simulation task is to drive the vehicle (as opposed to fighting it). A single chassis could serve the purpose of all three vehicles with minor reconfiguration. The same applies to each group below.

Because of the number of M113 and M901 vehicles needed in Virtual Brigade, we believe that the 14 simulators returning from Europe should be rebuilt as M113s with reconfigurability to M901.

FIST-V and COLT are essential to the battlefield, and we recommend that these built as new simulators. Again one replicab could serve both purposes.

The largest requirement for new simulators is the BFV. The addition of 42 simulators to the existing 14 will provide sufficient numbers to serve the training requirement. Half of these should have reconfigurability to M1A1 and M1A2. Generally, in exercises where large numbers of BFV are needed, fewer tanks are required. The reverse is also true.

The number of tanks should be increased by 11 new replicabs and they should have reconfigurability to M1A1 and M1A2.

The existing M1 tank simulators represent an obsolete vehicle. Consideration should be given to modifying them to M1A1 configuration. The argument that M1A1 crews can be trained in a low fidelity representation of an M1 is wearing a little thin.

Generic pods can serve many purposes. A total of 75 pods are needed, with 14 going to ARNG units. All pods should be identical and should have reconfigurability to the entire range of platforms indicated on the chart. If this is not technically feasible, the capabilities of the pods should be grouped as shown.

Blue SAF should be capable of generating up to 232 vehicles of the types shown. Given current technology, that implies at least 5 Blue SAF work stations (preferably ModSAF).

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RECOMMENDED SIMULATOR MIX

MIX.

VEHICLE CLASS	PLATFORM RECOFIGURATIONS	SIMULATOR TYPE								
		FT KNOX EXISTING	EUROPE RETURNS	NEW REPLICAB	GENERIC PODS AT KNOX	GENERIC PODS AT ARNG	SAFOR BLUE	SAFDI	TOC	BBS/ JANUS W/S
APC	M113,M577,M548				10		10			
	M113,M901		14							
	FIST-V,COLT			7		5	10			
	FDC				1	3	4			
BFV	M2,M3 (14 WITH M1A1,M1A2)	14		42						
DOZER	M9 ACE						4			
DUMP	M51,F817						4			
EVAC	M51,SEE				1		1			
FUEL	M978				5		26			
HOW	M109						8			
HV TRUCK	HEMTT,HET,M878,M916,M977						36			
LIFT	M10A,M4K,RTFL						6			
LT TRK	HMMWV - STINGER, TACP, M1009,M1025,M1028, M1038,M996,M998,				27	4	44			
MED-T	FOX,GEMSS,M35WW, M54WW,M813,M923				7	2	36			
MORTAR	M106						6			
TANK	M1*	42								
	M1A1, M1A2			11						
	AVLB,M728 CEV				4		4			
VTR	M88,MF78				3		11			
WRECKER	M543,M816,M936,M984				2		2			
DI	DSMT'D INF SQUAD							40		
	DSMT'T GSR							6		
	DSMT'D SCOUT							6		
OPNS HQ	BDE, BN, FSB,	3							4	7
LOG HQ	BN, CO TRAINS	1							11	12
RWA	OH58C, AH64,RH66						10			
FWA	A10						10			
JAMMERS					1					
	TOTALS	60	14	60	61	14	232	52	15	19

RECOMMENDED SIMULATOR MIX (continued)

Not mentioned on the chart is the whole topic of Red SAF. The training brigade in the Virtual Brigade needs to be able to fight against a Red Division. Much of this can be done in BBS; some will have to be done in SAF. The evolving BBS-SIMNET interface (under contract from NRaD) could be very useful here as a manpower saver. Two BBS-SIMNET suites playing Red could generate a sufficient enemy for the Brigade. We have not studied this issue closely, but it must not be ignored.

Another important but often ignored aspect of Virtual Brigade is the dismounted infantry. Our analysis indicates a requirement for 52 infantry squads that can be dismounted from the BFVs and APCs. These numbers include dismounted scouts and engineers. The SAFDI capability developed by University of Central Florida (UCF) could serve this purpose. One SAFDI suite is capable of managing 11 squads. Five suites would meet the requirement.

Tactical Operations Centers (TOC) are required for operations and logistics headquarters. Some already exist in the CATT-C facility, but more are needed. We suggest building pads outside the building where units can bring their actual TOC equipment and connect into the communication system. This would save dollars and floor space while permitting the units to operate from their actual equipment.

The analysis that generated this recommended mix of simulators has a significant subjective component. Other people would produce different numbers. These numbers are submitted as a good start point for subsequent analysis, but we are confident that the recommendations are in the correct magnitude.

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RECOMMENDED SIMULATOR MIX

MIX

VEHICLE CLASS	PLATFORM RECOFIGURATIONS	SIMULATOR TYPE FT KNOX EXISTING	EUROPE RETURNS	NEW REPLICAB	GENERIC PODS AT KNOX	GENERIC PODS AT ARNG	SAFOR BLUE	SAFDI	TOC	BBS/ JANUS W/S
APC	M113,M577,M548				10		10			
	M113,M901		14							
	FIST-V,COLT			7		5	10			
	FDC				1	3	4			
BFV	M2,M3 (14 WITH M1A1,M1A2)	14		42						
DOZER	M9 ACE						4			
DUMP	M51,F817						4			
EVAC	M51,SEE				1		1			
FUEL	M978				5		26			
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WRECKER	M543,M816,M936,M984				2		2			
DI	DSMT'D INF SQUAD							40		
	DSMT'T GSR							6		
	DSMT'D SCOUT							6		
OPNS HQ	BDE, BN, FSB,	3							4	7
LOG HQ	BN, CO TRAINS	1							11	12
RWA	OH58C, AH64,RH66						10			
FWA	A10						10			
JAMMERS					1					
	TOTALS	60	14	60	61	14	232	52	15	19

RECOMMENDED TECHNICAL APPROACHES

The next three charts summarize our recommendations about what must be done to create a viable training environment.

1. The generic pod approach is a good technique for representing the large number of vehicle types for which only a small number of simulators is required and that do not require a crew to fight them. They do, however, create a management problem. Changing operators and configurations dynamically during the battle will be a real challenge.

2. A generic pod that can be reconfigured quickly (one minute) to any of the necessary configurations would provide maximum flexibility. We have not investigated the software design issues involved, but believe them to be tractable. The larger problem will be collecting the data to describe the necessary dynamics. This effort should begin immediately, regardless of the technical approach selected. Pods should be built around a low cost CIG so that a large number can be afforded.

3. Establishing command and control facilities outside the building will save cost and improve realism. Some facilities could be established in unit motor pools, eliminating the need to move equipment. This will require external hook-up to the SIMNET tactical communications network.

4. CSS units need not participate from the main facility. They can operate from their normal work places, given adequate communications. Note that communications between the companies and their battalion levels is generally by courier (hand-carried disks) for personnel and logistics data.

5. The AAR is the most important part of the training in Virtual Brigade. There should be a capability for multiple simultaneous AARs at the different echelons. This implies additional data loggers, AAR rooms, and observer/controllers to evaluate the exercises. The requirements for AARs should be defined in the Training Requirements Analysis.

6. The BBS-SIMNET interface offers a manpower saving approach to generating large forces on the Virtual Battlefield. This technology is in its early stages of development. The Virtual Brigade could become the driver of this effort by getting it installed at Ft. Knox right now. It would immediately expand the training capability of CATT-C and get the units up on the learning curve while providing evaluation and feedback to the developers.

7. The IDA analysis of the SIMNET simulators found that rebuilding the SIMNET simulators to other configurations is technically feasible and not very difficult. The more important question is what kind of simulators should be constructed. We think the 14 simulators returning from Europe should be rebuilt as M113 replicabs with reconfigurability to M901 ITV. This can be done with TASC resources and would add a significant new capability to CATT-C very quickly.

IDA

RECOMMENDED TECHNICAL APPROACHES

1. USE GENERIC PODS TO POPULATE THE BATTLEFIELD WITH VEHICLES THAT DO NOT REQUIRE A CREW TO FIGHT THE VEHICLE.

2. DEVELOP EACH POD TO HAVE MANY POSSIBLE CONFIGURATIONS (ONE DOES ALL) USING A LOW COST IMAGE GENERATOR (E.G., ONYX).

3. ESTABLISH TOC PADS OUTSIDE THE FACILITY TO SAVE FLOOR SPACE. UNITS CAN/SHOULD USE THEIR ACTUAL EQUIPMENT. CONSIDER PARTICIPATION OF C&C ELEMENTS FROM THEIR OWN MOTOR POOLS.

4. ALL UNITS SHOULD USE ORGANIC SERVICE SUPPORT SYSTEMS TO SIMULATE CSS FUNCTIONS. COMMUNICATIONS HOOKUPS BETWEEN ACTUAL AND SIMULATED SYSTEMS ARE NECESSARY.

5. DEVELOP A CAPABILITY TO SUPPORT MULTI-ECHELON AAR's.
   (DATA COLLECTION, TASK ASSESSMENT,
   RAPID ANALYSIS, USEFUL REPORTING)

6. INSTALL BBS-SIMNET INTERFACE AND START USING IT ASAP TO GET UP ON THE LEARNING CURVE.

7. CONVERT THE 14 EUROPE SIMULATORS INTO M113-M901 REPLICABS.

RECOMMENDED SIMNET FIXES

1. The evolving digital capabilities must be brought into the Virtual Brigade. This means that any simulator (replicab, pod, or SAF) should be able to take on a digital function on demand. We envision a "shopping cart" that can be connected to a simulator (replicab or pod) to install any of the full set of digital capabilities. In SAF these capabilities will have to be integrated into the software. The SAF operators will have to learn the tactics that go along with digital functions.

2. The SIMNET tactical communications systems is a hard-wired citizen's band (CB) system that produces unacceptable noise and crosstalk. It is also limited to a maximum of 40 channels. This system needs to be discarded and replaced by a digital network capable of more channels (we have not analyzed the numbers) and capable of extending to motor pools, outside pads, and remote sites.

3. Connections to other sites, such as the NG units or alternate facilities at Ft. Knox, will require a wide area digital network. There is no technical limitation here, but there is a cost associated with networking to remote sites and maintaining a continuous hookup that must be budgeted in the program plan.

4. Dismounted Infantry play a significant role on the real battlefield. They need to be brought into the Virtual Brigade training. The SAFDI capability developed by UCF is owned by the government and is available to fill this role. It should be installed as soon as possible, so that units can begin training with it and learn how to integrate it into their training scenarios.

5. Artillery play in SIMNET is rudimentary and unsatisfactory. The Virtual Brigade needs a realistic Fire Direction Center (FDC) capability that imposes appropriate delays and errors into fire support play. Forward Entry Devices (FED) and Digital Message Device (DMD) hook-ups should be provided for Forward Observers. The FDC (one of the generic pod configurations) should receive FED/DMD input and the FDC should be able to generate the appropriate response on the virtual battlefield. The FDC should also be capable of receiving verbal calls for fire.

6. Blue and Red SAF requirements will exceed the capability of the current work stations. Given the evolving nature of ModSAF, it is not possible to make a valid estimate of the number of work stations required. Analysis of this number is also dependent on the role that BBS will play in Virtual Brigade. The total SAF requirement appears to be over 2,000 entities. Without BBS, that could mean 40 ModSAF workstations, each generating 50 entities. With BBS-SIMNET picking up a share of the load, this number could be reduced to 15 to 20 workstations.

IDA

RECOMMENDED SIMNET FIXES

1. DEVELOP A DIGITAL TOOLKIT THAT CAN ATTACH TO ANY SIMULATOR. (IVIS, DMD, FDC)
2. UPGRADE THE TACTICAL COMMUNICATIONS SYSTEM, ADD THE CAPABILITY FOR REMOTE HOOK-UP.
3. BUILD A DIS CAPABLE NETWORK TO THE NG SITES.
4. DEVELOP SMOKE, NIGHT & MACHINE GUN EFFECTS.
5. INSTALL SAFDI.
6. AUTOMATE THE FDC FUNCTION, PROVIDE DMD HOOK-UP.
7. INCREASE THE ENEMY SAFOR CAPABILITY TO A DIVISION LEVEL FORCE. (MODSAF 1.?)
8. INCREASE THE NETWORK CAPACITY TO HANDLE ABOUT 3000 ENTITIES.
9. EXPAND THE CAPABILITY OF THE MCC TO HANDLE 150 VEHICLES.
10. UPGRADE THE COMBAT BN CSS APPLICATIONS - e.g., PSS, MAINT.

RECOMMENDED SIMNET FIXES (continued)

7. The two Ethernets in the SIMNET facilities are capable of interconnecting, and previous exercises (i.e., WAREX-90) demonstrated that they would handle up to about 800 entities which is about a fourth of the Virtual Brigade requirement. The Ethernets needs to be upgraded to handle 3,000 or more entities.

8. The SIMNET Management Control Center (MCC) currently manages 56 simulators and approximately 40 non-simulator entities. In Virtual Brigade these numbers will grow to about 150 simulators and zero non-simulator entities. The MCC is the Battle Master's tool for managing the battlefield. It needs to be re-evaluated to determine if it will handle the new load. It should be supplemented with management tools that control the configuration of the replicabs and pods, maintain records on battlefield losses (by name and bumper number), interface with the CSS systems, and manage the wide area network.

9. CSS functions in SIMNET are currently rudimentary at best. These should be upgraded to include a Personnel Service Support (PSS) simulation that produces casualties (a simple casualty card system would be a good start). The maintenance failure generation capability should be expanded to include a broader range of failures, and the resupply system should be expanded to include more than just Class III. The MCC needs to be able to monitor and data log CSS activities to maintain "ground truth" for AAR purposes.

IDA

RECOMMENDED SIMNET FIXES

1. DEVELOP A DIGITAL TOOLKIT THAT CAN ATTACH TO ANY SIMULATOR. (IVIS, DMD, FDC)
2. UPGRADE THE TACTICAL COMMUNICATIONS SYSTEM, ADD THE CAPABILITY FOR REMOTE HOOK-UP.
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10. UPGRADE THE COMBAT BN CSS APPLICATIONS - e.g., PSS, MAINT.

RECOMMENDED PROGRAM ACTIONS

1. Our analysis was based on an assumed training strategy. A much more detailed analysis of the training requirement is needed to determine exactly which tasks and skill should be trained. This should be a dedicated effort and will require many man-months to complete.

2. The new construction is vital to the success of the program. The approval, contracting, and construction processes are lengthy and must be started as quickly as possible to meet the training schedule of the 194th Brigade. It is unlikely that the building will be completed on time.

3. An existing facility to house Virtual Brigade, until the new facility is completed, should be identified at Ft. Knox. The alternate facility would be a hedge against late availability of the new facility. It could house the generic poc's, SAFDI, and other equipment that does not require the same vertical clearance as a SIMNET simulator or new replicab.

4. The Contractor Logistics Support (CLS) (plus Operations) currently provided to CATT-C is not robust enough to meet the needs of Virtual Brigade. The CLS for CATT-C and MWTB should be combined to ensure cooperation between the two facilities. More importantly, the definition of the support required should be expanded. The amount of equipment to be managed will grow, the type of equipment will change, and the role of the Battle Master and the technical support during a training exercise will change. For example, "Techs" will have to be on call to implement dynamic reconfiguration and to install digital equipment. Long exercises, 3 to 10 days in length, will require continuous running.

5. The addition of many new simulator types, integration of BBS/JANUS, collection of logistics data, expansion of AAR capabilities, and re-definition of the simulation management role of the Battle Master will challenge the credibility of the simulation. The changes need to be validated and verified by testing. This raises the following fundamental questions:

   a. Who will perform the test?

   b. How much testing will be enough?

   c. Who will pay?

   These questions must be addressed before putting a testing program in place. The Training Requirements Analysis (TRA) must be completed before the testing plan can be built. The TRA will determine the standards against which the simulation should be tested.

IDA

RECOMMENDED PROGRAM ACTIONS

1. CONDUCT A DETAILED TRAINING REQUIREMENTS ANALYSIS.
   (AC, RC, COMBAT, CS, CSS)

2 INITIATE THE BUILDING APPROVAL PROCESS ASAP.

3. IDENTIFY AN EXISTING FACILITY FOR REHAB AS A WORK AROUND IN THE EVENT (HIGHLY LIKELY) THAT THE NEW FACILITY IS NOT READY ON TIME.

4. COORDINATE CLS CONTRACTS BETWEEN MWTB & CATT-C.

5. DEVELOP A PLAN TO TEST/VALIDATE THE ADDITIONS TO THE CURRENT SIMNET CAPABILITY.
   (WHO WILL TEST? HOW MUCH IS ENOUGH? WHO WILL PAY?)

6. DEVELOP A PLAN TO TRANSITION THIS CAPABILITY AFTER MAY 96.

7. MAKE A PRESENTATION TO CONGRESS ASAP. NO FUNDING WITHOUT CONGRESSIONAL APPROVAL OF THE PLAN.

8. START VIRTUAL BRIGADE TRAINING NOW. A LOT CAN BE DONE WITH THE EXISTING CAPABILITY.

RECOMMENDED PROGI.AM ACTIONS (continued)

6. Some consideration should be given now as to what will happen to this capability after it has been demonstrated. If it is to be installed in other locations (e.g., Ft. Hood or Ft. Benning), the implications should be evaluated now. If Ft. Knox is to be the one and only site to serve all of the continental United States, then all of the schools in TRADOC should be involved in the planning.

   One potential future for VBTP is to designate it as a pre-trainer for the NTC. It would become a one-of-a-kind national mobile warfare preparation center where units could pre-train for their NTC rotation. The concept would be that a battalion or brigade would come to Ft. Knox four months prior to its NTC rotation. It would spend about eight days immersed in intense combat training. During this time it would exercise all of its systems, scrub its SOPs, and identify the areas that need emphasis in field training after they return to home station. This approach would ensure full use and would justify a significant investment by the Department of the Army.

7. The plan for Virtual Brigade should be briefed to Congress as early as possible, to ensure early funding of the program.

8. The good news is that the current SIMNET, in spite of some deficiencies, represents a very credible trainer. Some of the innovative techniques for using SIMNET that have evolved over the last few years show that a lot can be done with what exists today. Virtual Brigade should not rely solely on new facilities and equipment. Part of its success will derive from taking maximum advantage of the current capability.

IDA RECOMMENDED PROGRAM ACTIONS

1. CONDUCT A DETAILED TRAINING REQUIREMENTS ANALYSIS.
   (AC, RC, COMBAT, CS, CSS)

2 INITIATE THE BUILDING APPROVAL PROCESS ASAP.

3. IDENTIFY AN EXISTING FACILITY FOR REHAB AS A WORK AROUND IN THE EVENT (HIGHLY LIKELY) THAT THE NEW FACILITY IS NOT READY ON TIME.

4. COORDINATE CLS CONTRACTS BETWEEN MWTB & CATT-C.

5. DEVELOP A PLAN TO TEST/VALIDATE THE ADDITIONS TO THE CURRENT SIMNET CAPABILITY.
   (WHO WILL TEST? HOW MUCH IS ENOUGH? WHO WILL PAY?)

6. DEVELOP A PLAN TO TRANSITION THIS CAPABILITY AFTER MAY 96.

7. MAKE A PRESENTATION TO CONGRESS ASAP. NO FUNDING WITHOUT CONGRESSIONAL APPROVAL OF THE PLAN.

8. START VIRTUAL BRIGADE TRAINING NOW. A LOT CAN BE DONE WITH THE EXISTING CAPABILITY.

VIRTUAL BATTLEFIELD ROADMAP

Many things need to be done to create the Virtual Brigade. This chart shows the major activity paths and milestones for getting from here-and-now to a brigade ready to deploy to NTC in May 1996. It does not have the analytical underpinning of a PERT chart analysis—it represents our estimates of what must be done, as opposed to what can be done.

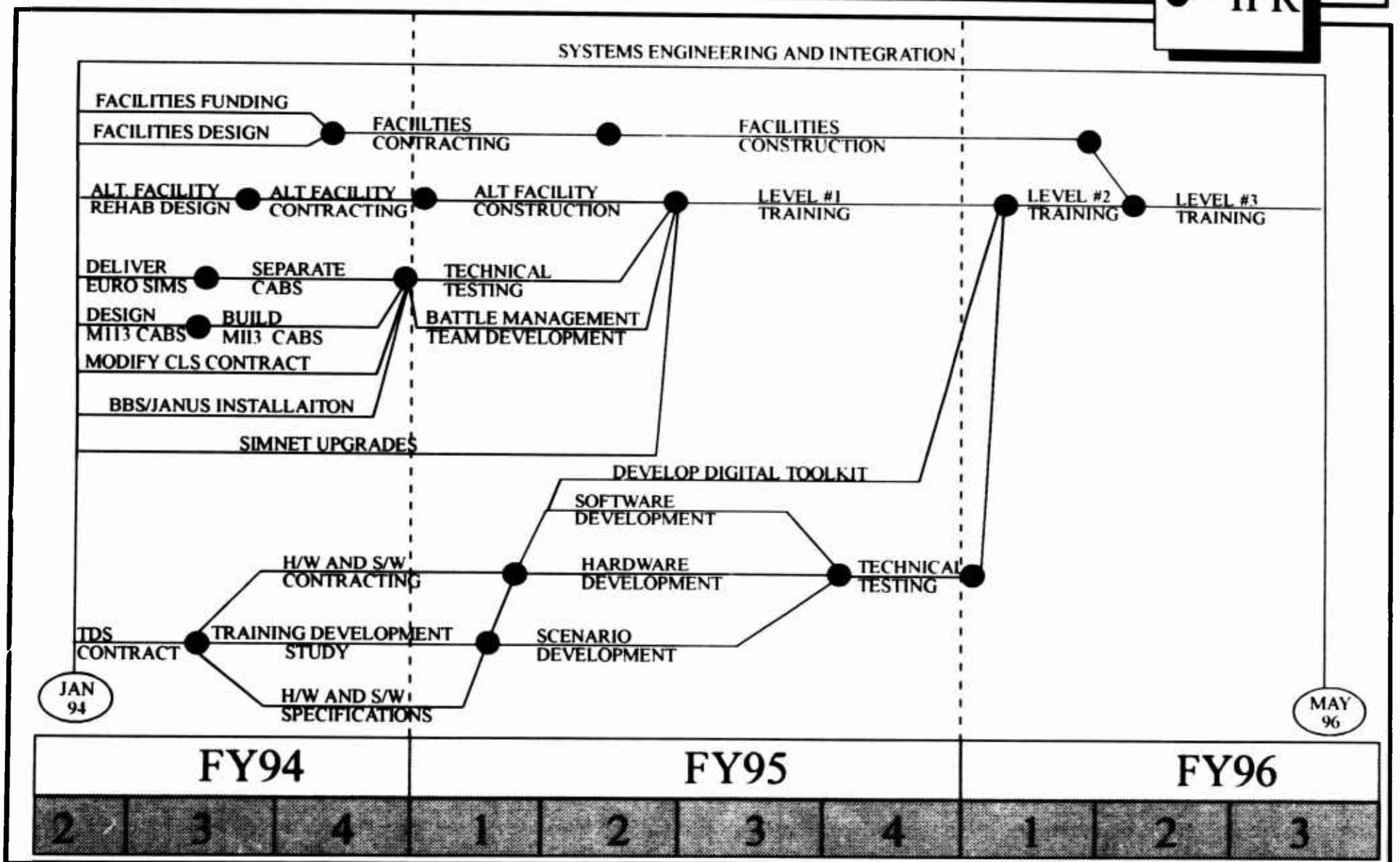
The pieces have all been discussed, vith the exception of levels of training. The three levels indicate a growing capability. Actually there is a Level #0 which means training with the current capability. The first real supplement to the current capability comes in mid-FY95 when the 14 Europe simulators have been rebuilt and installed and some of the SIMNET upgrades are completed. Level #2 begins when the new hardware and software are ready and tested. Level #3 begins when all of the new capabilities are operational in the new facility. Operational Testing of Level #3 will parallel training for NTC rotation.

Realistic estimates of the times to complete the various phases of this roadmap depend on contracts that have not been implemented at this time. The reality is that they always take longer than the estimate. The message is that Virtual Brigade is already behind schedule and the problem will get worse instead of better as the real answers come in.

IDA

VIRTUAL BATTLEFIELD ROADMAP

● = IPR



APPENDIX A. TRAINING ANALYSIS DATABASE

1. This Appendix contains the data used to determine how many of each type of simulator are needed to support the VBTP requirement.

2. The first matrix is the baseline TO&E of the 194th Separate Armored Brigade. It represents the projected composition of the brigade for its NTC rotation May 1996.

   a. One battalion task force, TF 1-70, is expected to remain at Ft. Knox during the rotation and is, therefore, not included in the database.

   b. The columns represent the number of vehicles by category (APC, BFV, DOZer, DUMp Truck, EVACuator, FUEl, HOWitzer, HeaVy Truck, fork LIFt, LighT Truck, MEdium Truck, MORtar, VTR, WREcker, and Dismounted Infantry). These categories were used to simplify the matrix. A more detailed look at the brigade should be done on a by-model number basis.

   c. The allocation of vehicle to the sub-unit level was based on military judgment and experience. The brigade TO&E does not make this allocation.

   d. The baseline TO&E is not 100% complete. There are clearly some vehicles missing and the uncertainties surrounding the projections two years in the future make accuracy an elusive goal. We believe the data presented here is accurate enough for this first cut analysis.

   e. The various sub-total categories at the bottom are explained in the next paragraph.

3. Following the baseline TO&E are seven vignettes (five pages each) designed around a spectrum of training event. Using the baseline TO&E we selected which vehicles should be represented in the exercise and how they should be represented. The vignettes are defined in the earlier text and named at the top of each matrix. The numbers at the end of each vignette are total number of vehicles by category that we would use in the exercise. They are broken out into modes:

   a. SIM. This mode includes those vehicles that should have dedicated replicabs (simulators) with manned crews.

   b. Unassigned. This mode includes those vehicles that need to be represented occasionally on the battlefield as a manned simulator, but do not necessarily need a dedicated simulator. The crews of these vehicles are assigned to a simulator only part time during the exercise, which permits several crews to use the same simulator.

   c. SAF. These vehicle are represented as by Semi-Automated Force systems.

   d. BBS/JANUS. Vehicles that need to be present on the battlefield, not included in one of the previous three categories, are included here. These models can account for a large number of vehicles without much overhead.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	SIMULATOR REQUIREMENTS ANALYSIS FOR PROJECTED 194TH BDE																				
2	AS OF 28 DEC 93																				
3																					
4																					
5	HHC, D/10, TF2-33, TF2-136, 1-201 FA, A/77FA, 19EN, 75TH SPT																				
6																					
7																					
8																					
9			BASELINE TOE																		
10																					
11																					
12					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
13	BDE HHC																				
14		MP PLT												6							6
15		HQ SEC			1									2	1						4
16		S-1												1							1
17		S-2			1									1							2
18		S-3			3									3							6
19		S-4			1									1							2
20		MAINT SEC			1									1	2			1			5
21		COMMO SEC												3							3
22																					
23	HHC SUB-TOTAL				7									18	3			1			29
24																					
25		SIMS																			
26		UNASSIGNED																			
27		SAF																			
28		BBS/JANUS			7									18	3			1			29
29																					
30																					
31					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
32	TF 2-33																				
33		HHC, 2-33																			
34			CMD SEC											2			1				3
35			S-1												1						1
36			S-2		1																1
37			S-3		2									2	1		1				6
38			S-4		1									1							2
39			HQ SEC		1									2	2						5
40			COMMO SEC											2							2
41			SCOUT PLT			6															6
42			MORTAR PLT		2									2		6					10
43			SUPPORT PLT							17		16			6						39
44			MESS SEC											1	3						4
45			MEDICAL PLT		10									1	1						12
46			MAINT LT											2							2
47				SUPPLY SEC											5						5
48				RECOVERY SEC											1			3	2		6
49				MAINT SEC										1	4						5
50				CO A TEAM	1										1			1			3
51				CO B TEAM	1										1			1			3
52				CO C TEAM	1										1			1			3
53				CO D TEAM	1										1			1			3
54			UNIT MINISTRY											1							1
55		CO A (TANK)																			
56			HQ SEC											2	1		2				5
57			1ST PLT														4				4
58			2ND PLT														4				4
59			3RD PLT														4				4
60		CO B (TANK)																			
61			HQ SEC											2	1		2				5
62			1ST PLT														4				4
63			2ND PLT														4				4
64			3RD PLT														4				4
65		CO C (TANK)																			
66			HQ SEC											2	1		2				5
67			1ST PLT														4				4
68			2ND PLT														4				4
69			3RD PLT														4				4
70		CO D (MECH)																			
71			HQ SEC		1	2								2	2					1	8
72			1ST PLT (RIFLE)			4														3	7
73			2ND PLT (RIFLE)			4														3	7
74			3RD PLT (RIFLE)			4														3	7

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
75				4TH PLT (AT)		5																5
76	TF 2-33 SUB-TOTAL					27	20				17		16		25	33	6	44	7	2	10	207
77		SIM																				
78		UNASSIGNED																				
79		SAF																				
80		BBS/JANUS				27	20				17		16		25	33	6	44	7	2	10	207
81																						
82																						
83						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	W	REDI	TOT
84	TF 2-136																					
85		HHC																				
86			CMD SEC				1								2							3
87			S-1													1						1
88			S-2			1																1
89			S-3			2	1								2	1						6
90			S-4			1									1							2
91			HQ SEC			1									2	2						5
92			COMMO SEC												2							2
93			SCOUT PLT				6															6
94			MORTAR PLT			2									2		6					10
95			SPT PLT								17		16			6						39
96			MESS												1	3						4
97			MED PLT			10									1	1						12
98			MAINT PLT												2							2
99				SUPPLY SEC												5						5
100				RECOVERY SEC												1			3	2		6
101				MAINT SEC											1	4						5
102				CO A TEAM		1										1			1			3
103				CO B TEAM		1										1			1			3
104				CO C TEAM		1										1			1			3
105				CO D TEAM		1										1			1			3
106			UNIT MINISTRY												1							1
107		CO A (TANK)																				
108			HQ SEC												1	1		2				4
109			1ST PLT															4				4
110			2ND PLT															4				4
111			3RD PLT															4				4
112		CO B (MECH)																				
113			HQ SEC			1	2								2	2					1	8
114			1ST PLT (RIFLE)				4														3	7
115			2ND PLT (RIFLE)				4														3	7
116			3RD PLT (RIFLE)				4														3	7
117			4TH PLT (AT)			5																5
118		CO C (MECH)																				
119			HQ SEC			1	2								2	2					1	8
120			1ST PLT (RIFLE)				4														3	7
121			2ND PLT (RIFLE)				4														3	7
122			3RD PLT (RIFLE)				4														3	7
123			4TH PLT (AA)			5																5
124		CO D(MECH)																				
125			HQ SEC			1	2								2	2					1	8
126			1ST PLT (RIFLE)				4														3	7
127			2ND PLT (RIFLE)				4														3	7
128			3RD PLT (RIFLE)				4														3	7
129			4TH PLT (AT)			5																5
130	TF 2-136 SUB-TOTAL					39	50				17		16		24	35	6	14	7	2	30	240
131		SIM																				
132		UNASSIGNED																				
133		SAF																				
134		BBS/JANUS				39	50				17		16		24	35	6	14	7	2	30	240
135																						
136																						
137						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	W	REDI	TOT
138	D-10 CAV TROOP																					
139			HQ SEC								3				3	1		1				8
140			1ST PLT (TANK)															4				4
141			2ND PLT (TANK)															4				4
142			3RD PLT (SCOUT)				6														6	12
143			4TH PLT (SCOUT)				6														6	12
144																						
145	D-10 CAV SUB-TOTAL						12				3				3	1		9			12	40
146		SIM																				
147		UNASSIGNED																				
148		SAF																				
149		BBS/JANUS					12				3				3	1		9			12	40

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
150																						
151						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
152	COMBAT SUPPORT																					
153																						
154		ADA PLT													6							6
155																						
156		CHEMICAL PLT																				
157			RECON SEC												1							1
158			SMOKE SEC													4						4
159																						
160		MI COMPANY				6									15	7					6	34
161																						
162	CS SUB-TOTAL					6									22	11					6	45
163		SIMS																				
164		UNASSIGNED																				
165		SAF																				
166		BBS/JANUS				6									22	11					6	45
167																						
168						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
169	1-201 FA BN																					
170		HHB													16	9						25
171			HQ SEC																			
172			S-1																			
173			S-2			1																1
174			S-3			2																2
175			S-4			1					5											6
176			FIST SEC			17																17
177			COLT SEC			2																2
178			MESS																			
179			MAINT			1							1						1			3
180			MED SEC																			
181			COMMO PLT																			
182			METROLOGICAL SEC																			
183			RECON SEC																			
184		A BATTERY																				
185			HQ SEC								1				2	1						4
186			DETAIL SEC												1							1
187			AMMO PLT										8									8
188			MAINT SEC													2			1			3
189			SURVEY SEC												1							1
190			COMMO SEC												1							1
191			1ST PLT																			
192				HQ											2	1						3
193				FDC		1																1
194				HOW		4						4										8
195			2ND PLT																			
196				HQ											2	1						3
197				FDC		1																1
198				HOW		4						4										8
199		B BATTERY																				
200			HQ SEC								1				2	1						4
201			DETAIL SEC												1							1
202			AMMO PLT										8									8
203			MAINT SEC													2			1			3
204			SURVEY SEC												1							1
205			COMMO SEC												1							1
206			1ST PLT																			
207				HQ											2	1						3
208				FDC		1																1
209				HOW		4						4										8
210			2ND PLT																			
211				HQ											2	1						3
212				FDC		1																1
213				HOW		4						4										8
214		C BATTERY																				
215			HQ SEC								1				2	1						4
216			DETAIL SEC												1							1
217			AMMO PLT										8									8
218			MAINT SEC													1			1			2
219			SURVEY SEC												1							1
220			COMMO SEC												1							1
221			1ST PLT																			
222				HQ											2	1						3
223				FDC		1																1
224				HOW		4						4										8

			2ND PLT																						
				HQ												2	1								3
				FDC	1																				1
				HOW	4						4														8
				HOW	4						4														8
		A/77	BATTERY																						
			HQ SEC						1							2	1								4
			DETAIL SEC													1									1
			AMMO PLT									8													8
			MAINT SEC														1			1				2
			SURVEY SEC													1									1
			COMMO SEC													1									1
			1ST PLT																						
				HQ												2	1								3
				FDC	1																				1
				HOW	4						4														8
			2ND PLT																						
				HQ												2	1								3
				FDC	1																				1
				HOW	4						4														8
	ARTY BN SUB-TOTAL				68					9	36	33			52	27			5						230
		SIM																							
		UNASSIGNED																							
		SAF																							
		BBS/JANUS			68					9	36	33			52	27			5						230
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF		LT-T	ME-T	MOR	TAN	VTR	WRED		TOT			
	19TH ENGR BN																								
		HHC			7					4		3	1		11	12				1					39
			HQ SEC																						
			S-1																						
			S-2																						
			S-3																						
			S-4																						
				MAINT PLT															3						3
				SPT PLT																					
			COMMO SEC																						
			MESS																						
		A CO																							
			HQ SEC		1										2			4							7
			SP PLT																						
				PLT HQ											1										1
				EQUIP SEC			4																		4
				MAINT SEC																1	1				2
			1ST PLT (ENGR)		4																4				8
			2ND PLT (ENGR)		4																4				8
			4TH PLT (ASLT/OB)		1			4	1			4			4			6							20
		B CO																							
			HQ SEC		1										2			4							7
			SP PLT																						
				PLT HQ											1										1
				EQUIP SEC			4																		4
				MAINT SEC																1	1				2
			1ST PLT (ENGR)		4																4				8
			2ND PLT (ENGR)		4																4				8
			4TH PLT (ASLT/OB)		1			4	1			4			4			6							20
		C CO																							
			HQ SEC		1										2			4							7
			SP PLT																						
				PLT HQ											1										1
				EQUIP SEC			4																		4
				MAINT SEC																1	1				2
			1ST PLT (ENGR)		4																4				8
			2ND PLT (ENGR)		4																4				8
			4TH PLT (ASLT/OB)		1			4	1			4			4			6							20
		D CO (ENGR ASLT)																							
			HQ SEC									2													2
			ASLT & BARRIER SEC				3	4	9			1													17
			MAINT SEC													1				1					2
			1ST PLT (ENGR)									4													4
			2ND PLT (ENGR)									4													4
			3RD PLT (ENGR)									4													4

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
19TH ENGR SUB-TOTAL					37		15	16	12	4		30	1	32	13		30	3	5	27	225
	SIM																				
	UNASSIGNED																				
	SAF																				
	BBS/JANUS				37		15	16	12	4		30	1	32	13		30	3	5	27	225
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
75TH SPT BN					4					3		19	4	75	64				2		171
	HHD				4																4
		BN HQ																			
			COMMO SEC																		
			S-1																		
			S-2/3																		
			SPT OP SEC																		
			S-4																		
		HQ DET																			
	SUPPLY & TRANS CO												7	35	7						49
		HQ																			
		AMMO TRANSFER																			
		SUPPLY PLT																			
	MAINT CO											3	4	26	3			2	8		46
		HQ																			
			MAINT CONT TM																		
			RECOVERY SEC																		
			STORE DX																		
			ARMAMENT PLT																		
			GROUND SPT																		
		TANK SYS SPT TM																			
		TANK SYS SPT TM																			
		INF MECH SPT TM																			
	MEDICAL CO				6									8	1				1		16
		HQ																			
		AMBL PLT																			
		TREATMENT PLT																			
		HOLDING PLT																			
		PREV MED SEC																			
75TH SPT BN					14					3		22	15	144	75			2	11		286
	SIM																				
	UNASSIGNED																				
	SAF																				
	BBS/JANUS				14					3		22	15	144	75			2	11		286
194TH BDE TOTAL					198	82	15	16	12	53	36	117	16	320	198	12	97	25	20	85	1302
	SIM																				
	UNASSIGNED																				
	SAF																				
	BBS/JANUS				198	82	15	16	12	53	36	117	16	320	198	12	97	25	20	85	1302

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
SIMULATOR REQUIREMENTS ANALYSIS FOR PROJECTED 194TH BDE																					
TF (ARMOR HV) SLICE MOVEMENT TO CONTACT - AS OF 3 JAN 94																					
HHC, D/10, TF2-33, TF2-136, 1-201 FA, A/77FA, 19EN, 75TH SPT																					
			BASELINE TOE																		
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
IDE HHC																					
	MP PLT													6							6
	HQ SEC				1																1
	S-1																				
	S-2																				
	S-3				1																1
	S-4																				
	MAINT SEC																				

			COMMO SEC																		
HHC SUB-TOTAL					7									18	3			1			29
			SIMS		2									6							8
			UNASSIGNED																		
			SAF																		
			BBS/JANUS		5									12	3			1			21
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
TF 2-33																					
			HHC 2-33																		
				CMD SEC													1				1
				S-1																	
				S-2																	
				S-3	1												1				2
				S-4																	
				HQ SEC										1							1
				COMMO SEC																	
				SCOUT PLT		6															6
				MORTAR PLT										1							1
				SUPPORT PLT						4		4									8
				MESS SEC																	
				MEDICAL PLT										1							1
				MAINT PLT										1							1
				SUPPLY SEC																	
				RECOVERY SEC											1						1
				MAINT SEC										1							1
				CO A TEAM	1																1
				CO B TEAM	1																1
				CO C TEAM	1																1
				CO D TEAM	1																1
				UNIT MINISTRY																	
			CO A (TANK)																		
				HQ SEC										1			2				3
				1ST PLT													4				4
				2ND PLT													4				4
				3RD PLT													4				4
			CO B (TANK)																		
				HQ SEC										1			2				3
				1ST PLT													4				4
				2ND PLT													4				4
				3RD PLT													4				4
			CO C (TANK)																		
				HQ SEC										1			2				3
				1ST PLT													4				4
				2ND PLT													4				4
				3RD PLT													4				4
			CO D (MECH)																		
				HQ SEC		2								1							3
				1ST PLT (RIFLE)		4															4
				2ND PLT (RIFLE)		4															4
				3RD PLT (RIFLE)		4															4
				4TH PLT (AT)	5																5
TF 2-33 SUB-TOTAL					27	20				17		16		25	33	6	44	7	2	10	207
			SIM		10	20				4		4		9	1		44				92
			UNASSIGNED		3																3
			SAF		10					13		12			4	6		7	2		54
			BBS/JANUS		4									16	28					10	58
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
TF 2-136																					
			HHC																		
				CMD SEC																	
				S-1																	
				S-2																	
				S-3																	
				S-4																	
				HQ SEC																	
				COMMO SEC																	
				SCOUT PLT																	
				MORTAR PLT																	
				SPT PLT																	

				MESS																		
				MED PLT																		
				MAINT PLT																		
					SUPPLY SEC																	
					RECOVERY SEC																	
					MAINT SEC																	
					CO A TEAM																	
					CO B TEAM																	
					CO C TEAM																	
					CO D TEAM																	
				UNIT MINISTRY																		
			CO A (TANK)																			
				HQ SEC																		
				1ST PLT																		
				2ND PLT																		
				3RD PLT																		
			CO B (MECH)																			
				HQ SEC																		
				1ST PLT (RIFLE)																		
				2ND PLT (RIFLE)																		
				3RD PLT (RIFLE)																		
				4TH PLT (AT)																		
			CO C (MECH)																			
				HQ SEC																		
				1ST PLT (RIFLE)																		
				2ND PLT (RIFLE)																		
				3RD PLT (RIFLE)																		
				4TH PLT (AT)																		
			CO D (MECH)																			
				HQ SEC																		
				1ST PLT (RIFLE)																		
				2ND PLT (RIFLE)																		
				3RD PLT (RIFLE)																		
				4TH PLT (AT)																		
TF 2-136			SUB-TOTAL		39	50				17		16		24	35	6	14	7	2	30	240	
			SIM																			
			UNASSIGNED																			
			SAF																			
			BBS/JANUS		39	50				17		16		24	35	6	14	7	2	30	240	
					APC	BFV	DOZ	DUMEVA		FUE	HOW	HV-TLIF		LT-T	ME-TMORTAN		VTR	WREDI		TOT		
D-10 CAV			TROOP																			
				HQ SEC										1			1				2	
				1ST PLT (TANK)													4				4	
				2ND PLT (TANK)													4				4	
				3RD PLT (SCOUT)		6															6	
				4TH PLT (SCOUT)		6															6	
D-10 CAV			SUB-TOTAL			12				3				3	1		9			12	40	
			SIM			12								1			9				22	
			UNASSIGNED																			
			SAF							3											3	
			BBS/JANUS											2	1					12	15	
					APC	BFV	DOZ	DUMEVA		FUE	HOW	HV-TLIF		LT-T	ME-TMORTAN		VTR	WREDI		TOT		
COMBAT SUPPORT																						
			ADA PLT																			
			CHEMICAL PLT																			
				RECON SEC										1							1	
				SMOKE SEC																		
			MI COMPANY																			
CS SUB-TOTAL					6									22	11					6	45	
			SIMS											1							1	
			UNASSIGNED																			
			SAF																			
			BBS/JANUS		6									21	11					6	44	
					APC	BFV	DOZ	DUMEVA		FUE	HOW	HV-TLIF		LT-T	ME-TMORTAN		VTR	WREDI		TOT		
1-201 FA BN																						
			HHB																			

			HQ SEC																			
			S-1																			
			S-2																			
			S-3																			
			S-4																			
			FIST SEC		5																	5
			COLT SEC		2																	2
			MESS																			
			MAINT																			
			MED SEC																			
			COMMO PLT																			
			METROLOGICAL SEC																			
			RECON SEC																			
		A BATTERY																				
			HQ SEC																			
			DETAIL SEC																			
			AMMO PLT																			
			MAINT SEC																			
			SURVEY SEC																			
			COMMO SEC																			
			1ST PLT																			
				HQ																		
				FDC																		
				HOW																		
			2ND PLT																			
				HQ																		
				FDC																		
				HOW																		
		B BATTERY																				
			HQ SEC																			
			DETAIL SEC																			
			AMMO PLT																			
			MAINT SEC																			
			SURVEY SEC																			
			COMMO SEC																			
			1ST PLT																			
				HQ																		
				FDC																		
				HOW																		
			2ND PLT																			
				HQ																		
				FDC																		
				HOW																		
		C BATTERY																				
			HQ SEC																			
			DETAIL SEC																			
			AMMO PLT																			
			MAINT SEC																			
			SURVEY SEC																			
			COMMO SEC																			
			1ST PLT																			
				HQ																		
				FDC																		
				HOW																		
			2ND PLT																			
				HQ																		
				FDC																		
				HOW																		
				HOW																		
		A/77 BATTERY																				
			HQ SEC													1						1
			DETAIL SEC													1						1
			AMMO PLT										1									1
			MAINT SEC														1					1
			SURVEY SEC													1						1
			COMMO SEC																			
			1ST PLT																			
				HQ												1						1
				FDC	1																	1
				HOW																		
			2ND PLT																			
				HQ												1						1
				FDC	1																	1
				HOW																		

		F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
ARTY BN SUB-TOTAL		68					9	36	33		52	27			5			230
SIM		9							1		5	1						16
UNASSIGNED																		
SAF		8						8										16
BBS/JANUS		51					9	28	32		47	26			5			198
		APC	BFV	DOZ	DUMEVA		FUE	HOW	HV-TLIF		LT-T	ME-TMOR	TAN	VTR	WREDI			TOT
19TH ENGR BN																		
HHC																		
HQ SEC																		
S-1																		
S-2																		
S-3																		
S-4																		
MAINT PLT																		
SPT PLT																		
COMMO SEC																		
MESS																		
A CO																		
HQ SEC		1																1
SP PLT																		
PLT HQ											1							1
EQUIP SEC																		
MAINT SEC																		
1ST PLT (ENGR)		1																1
2ND PLT (ENGR)		1																1
4TH PLT (ASLT/OB)		1												6				7
B CO																		
HQ SEC																		
SP PLT																		
PLT HQ																		
EQUIP SEC																		
MAINT SEC																		
1ST PLT (ENGR)																		
2ND PLT (ENGR)																		
4TH PLT (ASLT/OB)																		
C CO																		
HQ SEC																		
SP PLT																		
PLT HQ																		
EQUIP SEC																		
MAINT SEC																		
1ST PLT (ENGR)																		
2ND PLT (ENGR)																		
4TH PLT (ASLT/OB)																		
D CO (ENGR ASLT)																		
HQ SEC																		
ASLT & BARRIER SEC																		
MAINT SEC																		
1ST PLT (ENGR)																		
2ND PLT (ENGR)																		
3RD PLT (ENGR)									4									4
19TH ENGR SUB-TOTAL		37		15	16	12	4		30	1	32	13		30	3	5	27	225
SIM									4									4
UNASSIGNED																		
SAF				4	4	1					6			6	1			22
BBS/JANUS		37		11	12	11	4		26	1	26	13		24	2	5	27	199
		APC	BFV	DOZ	DUMEVA		FUE	HOW	HV-TLIF		LT-T	ME-TMOR	TAN	VTR	WREDI			TOT
75TH SPT BN							3											3
HHD																		
BN HQ																		
COMMO SEC																		
S-1																		
S-2/3																		
SPT OP SEC																		
S-4																		
HQ DET																		
SUPPLY & TRANS CO																		
HQ																		
AMMO TRANSFER																		
SUPPLY PLT																		

		MAINT CO													4							4
			HQ																			
				MAINT CONT TM																		
				RECOVERY SEC																		
				STORE DX																		
				ARMAMENT PLT																		
				GROUND SPT																		
			TANK SYS SPT TM																			
			TANK SYS SPT TM																			
			INF MECH SPT TM																			
		MEDICAL CO				1									1	1						3
			HQ																			
			AMBL PLT																			
			TREATMENT PLT																			
			HOLDING PLT																			
			PREV MED SEC																			
	75TH SPT BN					14					3		22	15	144	75			2	11		286
		SIM				1					3				5	1						10
		UNASSIGNED													1			2				3
		SAF				11					1		7		7			3				29
		BBS/JANUS				2					-1		15	15	131	74		-5	2	11		244
	194TH BDE TOTAL					198	82	15	16	12	53	36	117	16	320	198	12	97	25	20	85	1302
		SIM				22	32				7		9		27	3		53				153
		UNASSIGNED				3									1			2				6
		SAF				29		4	4	1	17	8	19		13	4	6	9	8	2		124
		BBS/JANUS				144	50	11	12	11	29	28	89	16	279	191	6	33	17	18	85	1019

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
	SIMULATOR REQUIREMENTS ANALYSIS FOR PROJECTED 194TH BDE																				
	TF (ARMOR HV) SLICE IN DEFENSE AS OF 3 JAN 94																				
	HHC, D/10, TF2-33, TF2-136, 1-301 FA, A/77FA,19EN, 75TH SPT																				
			BASELINE TOE																		
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRED		TOT
	BDE HHC																				
		MP PLT																			
		HQ SEC			1										1						2
		S-1																			
		S-2																			
		S-3			1																1
		S-4																			
		MAINT SEC			1																1
		COMMO SEC																			
	HHC SUB-TOTAL				7									18	3			1			29
		SIMS			3										1						4
		UNASSIGNED																			
		SAF																			
		BBS/JANUS			4										17	3			1			25
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRED		TOT
	TF 2-33																				
		HHC, 2-33																			
			CMD SEC											1			1				2
			S-1																		
			S-2																		
			S-3														1				1
			S-4																		
			HQ SEC											1							1
			COMMO SEC																		
			SCOUT PLT			6															6

			MORTAR PLT																				
			SUPPORT PLT																				
			MESS SEC																				
			MEDICAL PLT																				
			MAINT PLT																				
				SUPPLY SEC																			
				RECOVERY SEC																			
				MAINT SEC																			
				CO A TEAM																			
				CO B TEAM																			
				CO C TEAM																			
				CO D TEAM																			
			UNIT MINISTRY																				
		CO A (TANK)																					
			HQ SEC																				
			1ST PLT																				
			2ND PLT																				
			3RD PLT																				
		CO B (TANK)																					
			HQ SEC																				
			1ST PLT																				
			2ND PLT																				
			3RD PLT																				
		CO C (TANK)																					
			HQ SEC																				
			1ST PLT																				
			2ND PLT																				
			3RD PLT																				
		CO D (MECH)																					
			HQ SEC																				
			1ST PLT (RIFLE)																				
			2ND PLT (RIFLE)																				
			3RD PLT (RIFLE)																				
			4TH PLT (AT)																				
	TF 2-33 SUB-TOTAL																						
	SIM																						
	UNASSIGNED																						
	SAF																						
	BBS/JANUS																						
				APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT			
	TF 2-136																						
	HHC																						
		CMD SEC																					
		S-1																					
		S-2																					
		S-3																					
		S-4																					
		HQ SEC																					
		COMMO SEC																					
		SCOUT PLT																					
		MORTAR PLT																					
		SPT PLT																					
		MESS																					
		MED PLT																					
		MAINT PLT																					
			SUPPLY SEC																				
			RECOVERY SEC																				
			MAINT SEC																				
			CO A TEAM																				
			CO B TEAM																				
			CO C TEAM																				
			CO D TEAM																				
		UNIT MINISTRY																					
		CO A (TANK)																					
			HQ SEC																				
			1ST PLT																				
			2ND PLT																				
			3RD PLT																				
		CO B (MECH)																					
			HQ SEC																				
			1ST PLT (RIFLE)																				
			2ND PLT (RIFLE)																				
			3RD PLT (RIFLE)																				

C	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
117				4TH PLT (AT)																		
118			CO C (MECH)																			
119				HQ SEC																		
120				1ST PLT (RIFLE)																		
121				2ND PLT (RIFLE)																		
122				3RD PLT (RIFLE)																		
123				4TH PLT (AA)																		
124			CO D(MECH)																			
125				HQ SEC																		
126				1ST PLT (RIFLE)																		
127				2ND PLT (RIFLE)																		
128				3RD PLT (RIFLE)																		
129				4TH PLT (AT)																		
130	TF 2-136		SUB-TOTAL			39	50				17		16		24	35	6	14	7	2	30	240
131			SIM																			
132			UNASSIGNED																			
133			SAF																			
134			BBS/JANUS			39	50				17		16		24	35	6	14	7	2	30	240
135																						
136																						
137						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
138	D-10 CAV TROOP																					
139				HQ SEC											1			1				2
140				1ST PLT (TANK)														4				4
141				2ND PLT (TANK)														4				4
142				3RD PLT (SCOUT)			6														6	12
143				4TH PLT (SCOUT)			6														6	12
144																						
145	D-10 CAV SUB-TOTAL						12				3				3	1		9			12	40
146			SIM				12								1			9			12	34
147			UNASSIGNED																			
148			SAF								3											3
149			BBS/JANUS												2	1						3
150																						
151						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
152	COMBAT SUPPORT																					
153																						
154			ADA PLT																			
155																						
156			CHEMICAL PLT																			
157				RECON SEC																		
158				SMOKE SEC																		
159																						
160			MI COMPANY																		6	6
161																						
162	CS SUB-TOTAL					6									22	11					6	45
163			SIMS																		6	6
164			UNASSIGNED			6																6
165			SAF											6								6
166			BBS/JANUS											-6	22	11						27
167																						
168						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
169	1-201 FA BN																					
170			HHB																			
171				HQ SEC																		
172				S-1																		
173				S-2																		
174				S-3																		
175				S-4																		
176				FIST SEC		6																6
177				COLT SEC		2																2
178				MESS																		
179				MAINT																		
180				MED SEC																		
181				COMMO PLT																		
182				METROLOGICAL SEC																		
183				RECON SEC																		
184			A BATTERY																			
185				HQ SEC																		
186				DETAIL SEC																		
187				AMMO PLT																		
188				MAINT SEC																		
189				SURVEY SEC																		
190				COMMO SEC																		
191				1ST PLT																		

C	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
192				HQ																		
193				FDC																		
194				HOW																		
195			2ND PLT																			
196				HQ																		
197				FDC																		
198				HOW																		
199		B BATTERY																				
200			HQ SEC																			
201			DETAIL SEC																			
202			AMMO PLT																			
203			MAINT SEC																			
204			SURVEY SEC																			
205			COMMO SEC																			
206			1ST PLT																			
207				HQ																		
208				FDC																		
209				HOW																		
210			2ND PLT																			
211				HQ																		
212				FDC																		
213				HOW																		
214		C BATTERY																				
215			HQ SEC																			
216			DETAIL SEC																			
217			AMMO PLT																			
218			MAINT SEC																			
219			SURVEY SEC																			
220			COMMO SEC																			
221			1ST PLT																			
222				HQ																		
223				FDC																		
224				HOW																		
225			2ND PLT																			
226				HQ																		
227				FDC																		
228				HOW																		
229				HOW																		
230		A/77 BATTERY																				
231			HQ SEC												1							1
232			DETAIL SEC												1							1
233			AMMO PLT																			
234			MAINT SEC																			
235			SURVEY SEC												1							1
236			COMMO SEC																			
237			1ST PLT																			
238				HQ											1							1
239				FDC		1																1
240				HOW																		
241			2ND PLT																			
242				HQ											1							1
243				FDC		1																1
244				HOW																		
245																						
246																						
247		ARTY BN SUB-TOTAL				68					9	36	33		52	27			5			230
248		SIM				10									5							15
249		UNASSIGNED																				
250		SAF				4						4	8									16
251		BBS/JANUS				54					9	32	25		47	27			5			199
252																						
253						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WREDI		TOT
254		19TH ENGR BN																				
255		HHC																				
256			HQ SEC																			
257			S-1																			
258			S-2																			
259			S-3																			
260			S-4																			
261				MAINT PLT																		
262				SPT PLT																		
263			COMMO SEC																			
264			MESS																			
265		A CO																				
266			HQ SEC			1												4				5

	C	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
267				SP PLT																			
268					PLT HQ																		
269					EQUIP SEC																		
270					MAINT SEC																		
271				1ST PLT (ENGR)			1																1
272				2ND PLT (ENGR)			1																1
273				4TH PLT (ASLT/OB)			1				1												2
274			B CO																				
275				HQ SEC																			
276				SP PLT																			
277					PLT HQ																		
278					EQUIP SEC																		
279					MAINT SEC																		
280				1ST PLT (ENGR)																			
281				2ND PLT (ENGR)																			
282				4TH PLT (ASLT/OB)																			
283			C CO																				
284				HQ SEC																			
285				SP PLT																			
286					PLT HQ																		
287					EQUIP SEC																		
288					MAINT SEC																		
289				1ST PLT (ENGR)																			
290				2ND PLT (ENGR)																			
291				4TH PLT (ASLT/OB)																			
292			D CO (ENGR ASLT)																				
293				HQ SEC																			
294				ASLT & BARRIER SEC																			
295				MAINT SEC																			
296				1ST PLT (ENGR)																			
297				2ND PLT (ENGR)																			
298				3RD PLT (ENGR)																			
299																							
300		19TH ENGR SUB-TOTAL					37		15	16	12	4		30	1	32	13		30	3	5	27	225
301		SIM					4				1								4				9
302		UNASSIGNED									1												1
303		SAF					3		4	4													11
304		BBS/JANUS					30		11	12	10	4		30	1	32	13		26	3	5	27	204
305																							
306							APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
307		75TH SPT BN																					
308		HHD																					
309			BN HQ																				
310				COMMO SEC																			
311				S-1																			
312				S-2/3																			
313				SPT OP SEC																			
314				S-4																			
315			HQ DET																				
316			SUPPLY & TRANS CO																				
317				HQ																			
318				AMMO TRANSFER																			
319				SUPPLY PLT																			
320																							
321																							
322																							
323																							
324			MAINT CO																				
325				HQ																			
326					MAINT CONT TM																		
327					RECOVERY SEC																		
328					STORE DX																		
329					ARMAMENT PLT																		
330					GROUND SPT																		
331				TANK SYS SPT TM																			
332				TANK SYS SPT TM																			
333				INF MECH SPT TM																			
334			MEDICAL CO				2																2
335				HQ																			
336				AMBL PLT																			
337				TREATMENT PLT																			
338				HOLDING PLT																			
339				PREV MED SEC																			
340																							
341		75TH SPT BN					14					3		22	15	144	75			2	11		286

C	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
342		SIM				2																2
343		UNASSIGNED																				
344		SAF				4									6			2				12
345		BBS/JANUS				8					3		22	15	138	75		-2	2	11		272
346																						
347																						
348	194TH BDE TOTAL					198	82	15	16	12	53	36	117	16	320	198	12	97	25	20	85	1302
349		SIM				32	32			1	4		4		13	1		57			28	172
350		UNASSIGNED				6				1												7
351		SAF				19		4	4		16	4	20	6	6		6	2	5	2		94
352		BBS/JANUS				141	50	11	12	10	33	32	93	10	301	197	6	38	20	18	57	1029

D	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	SIMULATOR REQUIREMENTS ANALYSIS FOR PROJECTED 194TH BDE																					
2	BDE CFX DOWN TO COMPANY, AS OF 3 JAN 94																					
3																						
4																						
5	HHC, D/10, TF2-33, TF2-136, 1-201 FA, A/77FA, 19EN, 75TH SPT																					
6																						
7																						
8																						
9				BASELINE TOE																		
10																						
11																						
12						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
13	BDE HHC																					
14		MP PLT																				
15		HQ SEC				1																1
16		S-1																				
17		S-2																				
18		S-3				1																1
19		S-4																				
20		MAINT SEC																				
21		COMMO SEC																				
22																						
23	HHC SUB-TOTAL					7									18	3			1			29
24																						
25		SIMS				2																2
26		UNASSIGNED																				
27		SAF																				
28		BBS/JANUS				5									18	3			1			27
29																						
30																						
31						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
32	TF 2-33																					
33		HHC, 2-33																				
34			CMD SEC												1			1				2
35			S-1																			
36			S-2																			
37			S-3															1				1
38			S-4																			
39			HQ SEC																			
40			COMMO SEC																			
41			SCOUT PLT																			
42			MORTAR PLT																			
43			SUPPORT PLT								4		4									8
44			MESS SEC																			
45			MEDICAL PLT			10									1							11
46			MAINT PLT																			
47				SUPPLY SEC																		
48				RECOVERY SEC																		
49				MAINT SEC																		
50				CO A TEAM		1																1
51				CO B TEAM		1																1
52				CO C TEAM		1																1
53				CO D TEAM		1																1
54			UNIT MINISTRY																			
55		CO A (TANK)																				
56			HQ SEC															2				2
57			1ST PLT																			
58			2ND PLT																			
59			3RD PLT																			
60		CO B (TANK)																				
61			HQ SEC															2				2
62			1ST PLT																			

D	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
63			2ND PLT																			
64			3RD PLT																			
65		CO C (TANK)																				
66			HQ SEC															2				2
67			1ST PLT																			
68			2ND PLT																			
69			3RD PLT																			
70		CO D (MECH)																				
71			HQ SEC				2														1	3
72			1ST PLT (RIFLE)																		3	3
73			2ND PLT (RIFLE)																		3	3
74			3RD PLT (RIFLE)																		3	3
75			4TH PLT (AT)			5																5
76	TF 2-33 SUB-TOTAL					27	20				17		16		25	33	6	44	7	2	10	207
77		SIM				19	2				4		4		2			8			10	49
78		UNASSIGNED														1						1
79		SAF				8	18				13		12					36	7			94
80		BBS/JANUS													23	32	6			2		63
81																						
82																						
83						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-TLIF		LT-T	ME-T	MOR	TAN	VTR	WRED	I	TOT
84	TF 2-136																					
85		HHC																				
86			CMD SEC				1															1
87			S-1																			
88			S-2																			
89			S-3				1															1
90			S-4																			
91			HQ SEC																			
92			COMMO SEC																			
93			SCOUT PLT																			
94			MORTAR PLT																			
95			SPT PLT																			
96			MESS																			
97			MED PLT												1							1
98			MAINT PLT																			
99				SUPPLY SEC																		
100				RECOVERY SEC																		
101				MAINT SEC																		
102				CO A TEAM		1																1
103				CO B TEAM		1																1
104				CO C TEAM		1																1
105				CO D TEAM		1																1
106			UNIT MINISTRY																			
107		CO A (TANK)																				
108			HQ SEC															2				2
109			1ST PLT																			
110			2ND PLT																			
111			3RD PLT																			
112		CO B (MECH)																				
113			HQ SEC				2														1	3
114			1ST PLT (RIFLE)																		3	3
115			2ND PLT (RIFLE)																		3	3
116			3RD PLT (RIFLE)																		3	3
117			4TH PLT (AT)																			
118		CO C (MECH)																				
119			HQ SEC				2														1	3
120			1ST PLT (RIFLE)																		3	3
121			2ND PLT (RIFLE)																		3	3
122			3RD PLT (RIFLE)																		3	3
123			4TH PLT (AA)																			
124		CO D (MECH)																				
125			HQ SEC				2														1	3
126			1ST PLT (RIFLE)																		3	3
127			2ND PLT (RIFLE)																		3	3
128			3RD PLT (RIFLE)																		3	3
129			4TH PLT (AT)																			
130	TF 2-136 SUB-TOTAL					39	50				17		16		24	35	6	14	7	2	30	240
131		SIM				4	8								1			2			30	45
132		UNASSIGNED																				
133		SAF				9	40											12				61
134		BBS/JANUS				26	2				17		16		23	35	6		7	2		134
135																						
136																						
137						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-TLIF		LT-T	ME-T	MOR	TAN	VTR	WRED	I	TOT

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
138	D-10 CAV TROOP																					
139			HQ SEC															1				1
140			1ST PLT (TANK)																			
141			2ND PLT (TANK)																			
142			3RD PLT (SCOUT)																		6	6
143			4TH PLT (SCOUT)																		6	6
144																						
145	D-10 CAV SUB-TOTAL						12				3				3	1		9			12	40
146		SIM																1			12	13
147		UNASSIGNED																				
148		SAF					12											8				20
149		BBS/JANUS									3				3	1						7
150																						
151						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
152	COMBAT SUPPORT																					
153																						
154		ADA PLT																				
155																						
156		CHEMICAL PLT																				
157			RECON SEC																			
158			SMOKE SEC																			
159																						
160		MI COMPANY																				
161																						
162	CS SUB-TOTAL					6									22	11					6	45
163		SIMS																				
164		UNASSIGNED																				
165		SAF																				
166		BBS/JANUS				6									22	11					6	45
167																						
168						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
169	1-201 FA BN																					
170		HHB																				
171			HQ SEC																			
172			S-1																			
173			S-2																			
174			S-3																			
175			S-4																			
176			FIST SEC			9																9
177			COLT SEC			2																2
178			MESS																			
179			MAINT																			
180			MED SEC																			
181			COMMO PLT																			
182			METROLOGICAL SEC																			
183			RECON SEC																			
184		A BATTERY																				
185			HQ SEC																			
186			DETAIL SEC																			
187			AMMO PLT																			
188			MAINT SEC																			
189			SURVEY SEC																			
190			COMMO SEC																			
191			1ST PLT																			
192				HQ																		
193				FDC																		
194				HOW																		
195			2ND PLT																			
196				HQ																		
197				FDC																		
198				HOW																		
199		B BATTERY																				
200			HQ SEC																			
201			DETAIL SEC																			
202			AMMO PLT																			
203			MAINT SEC																			
204			SURVEY SEC																			
205			COMMO SEC																			
206			1ST PLT																			
207				HQ																		
208				FDC																		
209				HOW																		
210			2ND PLT																			
211				HQ																		
212				FDC																		

D	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
213				HOW																		
214		C BATTERY																				
215			HQ SEC																			
216			DETAIL SEC																			
217			AMMO PLT																			
218			MAINT SEC																			
219			SURVEY SEC																			
220			COMMO SEC																			
221			1ST PLT																			
222				HQ																		
223				FDC																		
224				HOW																		
225			2ND PLT																			
226				HQ																		
227				FDC																		
228				HOW																		
229				HOW																		
230		A/77 BATTERY																				
231			HQ SEC																			
232			DETAIL SEC																			
233			AMMO PLT																			
234			MAINT SEC																			
235			SURVEY SEC																			
236			COMMO SEC																			
237			1ST PLT																			
238				HQ																		
239				FDC																		
240				HOW																		
241			2ND PLT																			
242				HQ																		
243				FDC																		
244				HOW																		
245																						
246																						
247	ARTY BN SUB-TOTAL					68					9	36	33		52	27			5			230
248		SIM				11																11
249		UNASSIGNED																				
250		SAF																				
251		BBS/JANUS				57					9	36	33		52	27			5			219
252																						
253						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRED		TOT
254	19TH ENGR BN																					
255		HHC																				
256			HQ SEC																			
257			S-1																			
258			S-2																			
259			S-3																			
260			S-4																			
261				MAINT PLT																		
262				SPT PLT																		
263			COMMO SEC																			
264			MESS																			
265		A CO																				
266			HQ SEC			1																1
267			SP PLT																			
268				PLT HQ																		
269				EQUIP SEC																		
270				MAINT SEC																		
271			1ST PLT (ENGR)																			
272			2ND PLT (ENGR)																			
273			4TH PLT (ASLT/OB)																			
274		B CO																				
275			HQ SEC																			
276			SP PLT																			
277				PLT HQ																		
278				EQUIP SEC																		
279				MAINT SEC																		
280			1ST PLT (ENGR)																			
281			2ND PLT (ENGR)																			
282			4TH PLT (ASLT/OB)																			
283		C CO																				
284			HQ SEC																			
285			SP PLT																			
286				PLT HQ																		
287				EQUIP SEC																		

D	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
288					MAINT SEC																	
289				1ST PLT (ENGR)																		
290				2ND PLT (ENGR)																		
291				4TH PLT (ASLT/OB)																		
292			D CO (ENGR ASLT)																			
293				HQ SEC																		
294				ASLT & BARRIER SEC																		
295				MAINT SEC																		
296				1ST PLT (ENGR)																		
297				2ND PLT (ENGR)																		
298				3RD PLT (ENGR)																		
299																						
300	19TH ENGR SUB-TOTAL					37		15	16	12	4		30	1	32	13		30	3	5	27	225
301		SIM				1																1
302		UNASSIGNED																				
303		SAF				9			4	1								6				20
304		BBS/JANUS				27		15	12	11	4		30	1	32	13		24	3	5	27	204
305																						
306						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-TLIF		LT-T	ME-T	MOR	TAN	VTR	WRED		TOT
307	75TH SPT BN																					
308		HHD																				
309			BN HQ																			
310				COMMO SEC																		
311				S-1																		
312				S-2/3																		
313				SPT OP SEC																		
314				S-4																		
315			HQ DET																			
316		SUPPLY & TRANS CO																				
317			HQ																			
318			AMMO TRANSFER																			
319			SUPPLY PLT																			
320																						
321																						
322																						
323																						
324		MAINT CO																				
325			HQ																			
326				MAINT CONT TM																		
327				RECOVERY SEC																		
328				STORE DX																		
329				ARMAMENT PLT																		
330				GROUND SPT																		
331			TANK SYS SPT TM																			
332			TANK SYS SPT TM																			
333			INF MECH SPT TM																			
334		MEDICAL CO													1							1
335			HQ																			
336			AMBL PLT																			
337			TREATMENT PLT																			
338			HOLDING PLT																			
339			PREV MED SEC																			
340																						
341	75TH SPT BN					14					3		22	15	144	75			2	11		286
342		SIM													1							1
343		UNASSIGNED																				
344		SAF				6									6							12
345		BBS/JANUS				8					3		22	15	137	75			2	11		273
346																						
347																						
348	194TH BDE TOTAL					198	82	15	16	12	53	36	117	16	320	198	12	97	25	20	85	1302
349		SIM				37	10				4		4		4			11			52	122
350		UNASSIGNED														1						1
351		SAF				32	70		4	1	13		12		6			62	7			207
352		BBS/JANUS				129	2	15	12	11	36	36	101	16	310	197	12	24	18	20	33	972

E	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	SIMULATOR REQUIREMENTS ANALYSIS FOR PROJECTED 194TH BDE																					
2	TF (MECH HV) SLICE IN THE ATTACK, AS OF 3 JAN 94																					
3																						
4																						
5	HHC, D/10, TF2-33, TF2-136, 1-201 FA, A/77FA, 19EN, 75TH SPT																					
6																						
7																						
8																						

				BASELINE TOE																			
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT		
BDE HHC																							
	MP PLT													6							6		
	HQ SEC				1																1		
	S-1																						
	S-2																						
	S-3				1																1		
	S-4																						
	MAINT SEC																						
	COMMO SEC																						
HHC SUB-TOTAL					7									18	3			1			29		
	SIMS				2									6							8		
	UNASSIGNED																						
	SAF																						
	BBS/JANUS				5									12	3			1			21		
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT		
TF 2-33																							
	HHC, 2-33																						
		CMD SEC																					
		S-1																					
		S-2																					
		S-3																					
		S-4																					
		HQ SEC																					
		COMMO SEC																					
		SCOUT PLT																					
		MORTAR PLT																					
		SUPPORT PLT																					
		MESS SEC																					
		MEDICAL PLT																					
		MAINT LT																					
			SUPPLY SEC																				
			RECOVERY SEC																				
			MAINT SEC																				
			CO A TEAM																				
			CO B TEAM																				
			CO C TEAM																				
			CO D TEAM																				
		UNIT MINISTRY																					
	CO A (TANK)																						
		HQ SEC																					
		1ST PLT																					
		2ND PLT																					
		3RD PLT																					
	CO B (TANK)																						
		HQ SEC																					
		1ST PLT																					
		2ND PLT																					
		3RD PLT																					
	CO C (TANK)																						
		HQ SEC																					
		1ST PLT																					
		2ND PLT																					
		3RD PLT																					
	CO D (MECH)																						
		HQ SEC																					
		1ST PLT (RIFLE)																					
		2ND PLT (RIFLE)																					
		3RD PLT (RIFLE)																					
		4TH PLT (AT)																					
TF 2-33 SUB-TOTAL					27	20				17		16		25	33	6	44	7	2	10	207		
	SIM																						
	UNASSIGNED																						
	SAF																						
	BBS/JANUS				27	20				17		16		25	33	6	44	7	2	10	207		
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT		

E	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
84	TF 2-136																					
85		HHC																				
86			CMD SEC				1															1
87			S-1																			
88			S-2																			
89			S-3				1															1
90			S-4																			
91			HQ SEC												1							1
92			COMMO SEC																			
93			SCOUT PLT																			
94			MORTAR PLT			2																2
95			SPT PLT								4		4									8
96			MESS																			
97			MED PLT																			
98			MAINT PLT												1							1
99				SUPPLY SEC																		
100				RECOVERY SEC																		
101				MAINT SEC																		
102				CO A TEAM		1																1
103				CO B TEAM		1																1
104				CO C TEAM		1																1
105				CO D TEAM		1																1
106			UNIT MINISTRY																			
107		CO A (TANK)																				
108			HQ SEC												1			2				3
109			1ST PLT															4				4
110			2ND PLT															4				4
111			3RD PLT															4				4
112		CO B (MECH)																				
113			HQ SEC				2								1						1	4
114			1ST PLT (RIFLE)				4														3	7
115			2ND PLT (RIFLE)				4														3	7
116			3RD PLT (RIFLE)				4														3	7
117			4TH PLT (AT)			5																5
118		CO C (MECH)																				
119			HQ SEC				2								1						1	4
120			1ST PLT (RIFLE)				4														3	7
121			2ND PLT (RIFLE)				4														3	7
122			3RD PLT (RIFLE)				4														3	7
123			4TH PLT (AA)			5																5
124		CO D(MECH)																				
125			HQ SEC				2								1						1	4
126			1ST PLT (RIFLE)				4														3	7
127			2ND PLT (RIFLE)				4														3	7
128			3RD PLT (RIFLE)				4														3	7
129			4TH PLT (AT)			5																5
130	TF 2-136 SUB-TOTAL					39	50				17		16		24	35	6	14	7	2	30	240
131		SIM				21	44				4		4		6			14			30	123
132		UNASSIGNED				11																11
133		SAF				4	6				13		12				6		7			48
134		BBS/JANUS				3									18	35				2		58
135																						
136																						
137						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
138	D-10 CAV TROOP																					
139			HQ SEC												1			1				2
140			1ST PLT (TANK)															4				4
141			2ND PLT (TANK)															4				4
142			3RD PLT (SCOUT)				6														6	12
143			4TH PLT (SCOUT)				6														6	12
144																						
145	D-10 CAV SUB-TOTAL						12				3				3	1		9			12	40
146		SIM					12								1			9			12	34
147		UNASSIGNED																				
148		SAF									3											3
149		BBS/JANUS													2	1						3
150																						
151						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
152	COMBAT SUPPORT																					
153																						
154		ADA PLT																				
155																						
156		CHEMICAL PLT																				
157			RECON SEC																			
158			SMOKE SEC																			

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
159																						
160		MI COMPANY																				
161																						
162	CS SUB-TOTAL					6									22	11					6	45
163		SIMS																				
164		UNASSIGNED													6							6
165		SAF																				
166		BBS/JANUS				6									16	11					6	39
167																						
168						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
169	1-201 FA BN																					
170		HHB																				
171			HQ SEC																			
172			S-1																			
173			S-2																			
174			S-3																			
175			S-4																			
176			FIST SEC			5																5
177			COLT SEC			1																1
178			MESS																			
179			MAINT																			
180			MED SEC																			
181			COMMO PLT																			
182			METROLOGICAL SE																			
183			RECON SEC																			
184		A BATTERY																				
185			HQ SEC																			
186			DETAIL SEC																			
187			AMMO PLT																			
188			MAINT SEC																			
189			SURVEY SEC																			
190			COMMO SEC																			
191			1ST PLT																			
192				HQ																		
193				FDC																		
194				HOW																		
195			2ND PLT																			
196				HQ																		
197				FDC																		
198				HOW																		
199		B BATTERY																				
200			HQ SEC																			
201			DETAIL SEC																			
202			AMMO PLT																			
203			MAINT SEC																			
204			SURVEY SEC																			
205			COMMO SEC																			
206			1ST PLT																			
207				HQ																		
208				FDC																		
209				HOW																		
210			2ND PLT																			
211				HQ																		
212				FDC																		
213				HOW																		
214		C BATTERY																				
215			HQ SEC																			
216			DETAIL SEC																			
217			AMMO PLT																			
218			MAINT SEC																			
219			SURVEY SEC																			
220			COMMO SEC																			
221			1ST PLT																			
222				HQ																		
223				FDC																		
224				HOW																		
225			2ND PLT																			
226				HQ																		
227				FDC																		
228				HOW																		
229				HOW																		
230		A/77 BATTERY																				
231			HQ SEC												1							1
232			DETAIL SEC																			
233			AMMO PLT																			

			MAINT SEC																				
			SURVEY SEC																				
			COMMO SEC																				
			1ST PLT																				
				HQ											1								1
				FDC																			
				HOW																			
			2ND PLT																				
				HQ											1								1
				FDC																			
				HOW																			
ARTY BN SUB-TOTAL					68					9	36	33		52	27			5				230	
	SIM				6									3								9	
	UNASSIGNED				12																	12	
	SAF									5	8	8	1					1				23	
	BBS/JANUS				50					4	28	25	-1	49	27			4				186	
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI		TOT	
19TH ENGR BN																							
	HHC																						
		HQ SEC																					
		S-1																					
		S-2																					
		S-3																					
		S-4																					
			MAINT PLT																				
			SPT PLT																				
		COMMO SEC																					
		MESS																					
	A CO																						
		HQ SEC												1									1
		SP PLT																					
			PLT HQ																				
			EQUIP SEC																				
			MAINT SEC																				
		1ST PLT (ENGR)			1																		1
		2ND PLT (ENGR)			1																		1
		4TH PLT (ASLT/OB)																					
	B CO																						
		HQ SEC																					
		SP PLT																					
			PLT HQ																				
			EQUIP SEC																				
			MAINT SEC																				
		1ST PLT (ENGR)																					
		2ND PLT (ENGR)																					
		4TH PLT (ASLT/OB)																					
	C CO																						
		HQ SEC																					
		SP PLT																					
			PLT HQ																				
			EQUIP SEC																				
			MAINT SEC																				
		1ST PLT (ENGR)																					
		2ND PLT (ENGR)																					
		4TH PLT (ASLT/OB)																					
	D CO (ENGR ASLT)																						
		HQ SEC																					
		ASLT & BARRIER SEC																					
		MAINT SEC																					
		1ST PLT (ENGR)																					
		2ND PLT (ENGR)																					
		3RD PLT (ENGR)																					
19TH ENGR SUB-TOTAL					37		15	16	12	4		30	1	32	13		30	3	5	27		225	
	SIM				2									1								3	
	UNASSIGNED				11																	11	
	SAF				6			4									6					16	
	BBS/JANUS				18		15	12	12	4		30	1	31	13		24	3	5	27		195	
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI		TOT	
75TH SPT BN																							
	HHD																						

E	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
309			BN HQ																			
310				COMMO SEC																		
311				S-1																		
312				S-2/3																		
313				SPT OP SEC																		
314				S-4																		
315			HQ DET																			
316		SUPPLY & TRANS CO													2							2
317			HQ																			
318			AMMO TRANSFER																			
319			SUPPLY PLT																			
320																						
321																						
322																						
323																						
324		MAINT CO													2							2
325			HQ																			
326				MAINT CONT T																		
327				RECOVERY SE																		
328				STORE DX																		
329				ARMAMENT PL																		
330				GROUND SPT																		
331			TANK SYS SPT TM																			
332			TANK SYS SPT TM																			
333			INF MECH SPT TM																			
334		MEDICAL CO													4							4
335			HQ																			
336			AMBL PLT																			
337			TREATMENT PLT																			
338			HOLDING PLT																			
339			PREV MED SEC																			
340																						
341	75TH SPT BN					14					3		22	15	144	75			2	11		286
342		SIM													8							8
343		UNASSIGNED																				
344		SAF																				
345		BBS/JANUS				14					3		22	15	136	75			2	11		278
346																						
347																						
348	194TH BDE TOTAL					196	82	15	16	12	53	36	117	16	320	198	12	97	25	20	85	1302
349		SIM				31	56				4		4		25			23			42	185
350		UNASSIGNED				34									6							40
351		SAF				10	6		4		21	8	20	1			6	6	8			90
352		BBS/JANUS				123	20	15	12	12	28	28	93	15	289	198	6	68	17	20	43	987

F	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	**SIMULATOR REQUIREMENTS ANALYSIS FOR PROJECTED 194TH BDE**																					
2	TF (MECH HV) SLICE IN MOVEMENT TO CONTACT, AS OF 3 JAN 94																					
3																						
4																						
5	**HHC, D/10, TF2-33, TF2-136, 1-201 FA, A/77FA,19EN, 75TH SPT**																					
6																						
7																						
8																						
9				BASELINE TOE																		
10																						
11																						
12						APC	BFV	DOZ	DUMEVA	FUE	HOW	HV-TLIF		LT-T	ME-T	MORTAN	VTR	WREDI		TOT		
13	BDE HHC																					
14		MP PLT													6							6
15		HQ SEC				1																1
16		S-1																				
17		S-2																				
18		S-3				1																1
19		S-4																				
20		MAINT SEC																				
21		COMMO SEC																				
22																						
23	HHC SUB-TOTAL					7									18	3			1			29
24																						
25		SIMS				2									6							8
26		UNASSIGNED																				
27		SAF																				
28		BBS/JANUS				5									12	3			1			21
29																						

	APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
TF 2-33																	
HHC 2-33																	
CMD SEC																	
S-1																	
S-2																	
S-3																	
S-4																	
HQ SEC																	
COMMO SEC																	
SCOUT PLT																	
MORTAR PLT																	
SUPPORT PLT																	
MESS SEC																	
MEDICAL PLT																	
MAINT LT																	
SUPPLY SEC																	
RECOVERY SEC																	
MAINT SEC																	
CO A TEAM																	
CO B TEAM																	
CO C TEAM																	
CO D TEAM																	
UNIT MINISTRY																	
CO A (TANK)																	
HQ SEC																	
1ST PLT																	
2ND PLT																	
3RD PLT																	
CO B (TANK)																	
HQ SEC																	
1ST PLT																	
2ND PLT																	
3RD PLT																	
CO C (TANK)																	
HQ SEC																	
1ST PLT																	
2ND PLT																	
3RD PLT																	
CO D (MECH)																	
HQ SEC																	
1ST PLT (RIFLE)																	
2ND PLT (RIFLE)																	
3RD PLT (RIFLE)																	
4TH PLT (AT)																	
TF 2-33 SUB-TOTAL	27	20				17		16		25	33	6	44	7	2	10	207
SIM																	
UNASSIGNED																	
SAF																	
BBS/JANUS	27	20				17		16		25	33	6	44	7	2	10	207

	APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
TF 2-136																	
HHC																	
CMD SEC		1															1
S-1																	
S-2																	
S-3		1															1
S-4																	
HQ SEC										1							1
COMMO SEC																	
SCOUT PLT		6															6
MORTAR PLT	2									1							3
SPT PLT						4		4									8
MESS																	
MED PLT																	
MAINT PLT										1							1
SUPPLY SEC																	
RECOVERY SEC																	
MAINT SEC																	
CO A TEAM	1																1
CO B TEAM	1																1
CO C TEAM	1																1

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
				CO D TEAM	1																1
				UNIT MINISTRY																	
			CO A (TANK)																		
				HQ SEC										1			2				3
				1ST PLT													4				4
				2ND PLT													4				4
				3RD PLT													4				4
			CO B (MECH)																		
				HQ SEC		2								1							3
				1ST PLT (RIFLE)		4															4
				2ND PLT (RIFLE)		4															4
				3RD PLT (RIFLE)		4															4
				4TH PLT (AT)	5																5
			CO C (MECH)																		
				HQ SEC		2								1							3
				1ST PLT (RIFLE)		4															4
				2ND PLT (RIFLE)		4															4
				3RD PLT (RIFLE)		4															4
				4TH PLT (AA)	5																5
			CO D(MECH)																		
				HQ SEC		2								1							3
				1ST PLT (RIFLE)		4															4
				2ND PLT (RIFLE)		4															4
				3RD PLT (RIFLE)		4															4
				4TH PLT (AT)	5																5
TF 2-136				SUB-TOTAL	39	50				17		16		24	35	6	14	7	2	30	240
				SIM	21	50				4		4		7			14				100
				UNASSIGNED	11																11
				SAF	4					13		12				6		7			42
				BBS/JANUS	3									17	35				2	30	87
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRED	I	TOT
D-10 CAV TROOP																					
				HQ SEC										1			1				2
				1ST PLT (TANK)													4				4
				2ND PLT (TANK)													4				4
				3RD PLT (SCOUT)		6															6
				4TH PLT (SCOUT)		6															6
D-10 CAV				SUB-TOTAL		12				3				3	1		9			12	40
				SIM		12								1			9				22
				UNASSIGNED																	
				SAF						3											3
				BBS/JANUS										2	1					12	15
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRED	I	TOT
COMBAT SUPPORT																					
				ADA PLT										1							1
				CHEMICAL PLT																	
					RECON SEC																
					SMOKE SEC																
				MI COMPANY																	
CS SUB-TOTAL					6									22	11					6	45
				SIMS										1							1
				UNASSIGNED																	
				SAF										5							5
				BBS/JANUS	6									16	11					6	39
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRED	I	TOT
1-201 FA BN																					
				HHB																	
					HQ SEC																
					S-1																
					S-2																
					S-3																
					S-4																
					FIST SEC	5															5
					COLT SEC	1															1
					MESS																
					MAINT																

			MED SEC																				
			COMMO PLT																				
			METROLOGICAL SE																				
			RECON SEC																				
		A BATTERY																					
			HQ SEC																				
			DETAIL SEC																				
			AMMO PLT																				
			MAINT SEC																				
			SURVEY SEC																				
			COMMO SEC																				
			1ST PLT																				
				HQ																			
				FDC																			
				HOW																			
			2ND PLT																				
				HQ																			
				FDC																			
				HOW																			
		B BATTERY																					
			HQ SEC																				
			DETAIL SEC																				
			AMMO PLT																				
			MAINT SEC																				
			SURVEY SEC																				
			COMMO SEC																				
			1ST PLT																				
				HQ																			
				FDC																			
				HOW																			
			2ND PLT																				
				HQ																			
				FDC																			
				HOW																			
		C BATTERY																					
			HQ SEC																				
			DETAIL SEC																				
			AMMO PLT																				
			MAINT SEC																				
			SURVEY SEC																				
			COMMO SEC																				
			1ST PLT																				
				HQ																			
				FDC																			
				HOW																			
			2ND PLT																				
				HQ																			
				FDC																			
				HOW																			
				HOW																			
		A/77 BATTERY																					
			HQ SEC													1							1
			DETAIL SEC																				
			AMMO PLT																				
			MAINT SEC																				
			SURVEY SEC																				
			COMMO SEC																				
			1ST PLT																				
				HQ												1							1
				FDC																			
				HOW																			
			2ND PLT																				
				HQ												1							1
				FDC																			
				HOW																			
ARTY BN SUB-TOTAL					68					9	36	33		52	27			5			230
	SIM				6									3							9
	UNASSIGNED				12																12
	SAF									5	8	8	1					1			23
	BBS/JANUS				50					4	28	25	-1	49	27			4			186
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WREDI		TOT
19TH ENGR BN																					

F	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
255		HHC																				
256			HQ SEC																			
257			S-1																			
258			S-2																			
259			S-3																			
260			S-4																			
261				MAINT PLT																		
262				SPT PLT																		
263			COMMO SEC																			
264			MESS																			
265		A CO																				
266			HQ SEC												1							1
267			SP PLT																			
268				PLT HQ																		
269				EQUIP SEC																		
270				MAINT SEC																		
271			1ST PLT (ENGR)			1																1
272			2ND PLT (ENGR)			1																1
273			4TH PLT (ASLT/OB)																			
274		B CO																				
275			HQ SEC																			
276			SP PLT																			
277				PLT HQ																		
278				EQUIP SEC																		
279				MAINT SEC																		
280			1ST PLT (ENGR)																			
281			2ND PLT (ENGR)																			
282			4TH PLT (ASLT/OB)																			
283		C CO																				
284			HQ SEC																			
285			SP PLT																			
286				PLT HQ																		
287				EQUIP SEC																		
288				MAINT SEC																		
289			1ST PLT (ENGR)																			
290			2ND PLT (ENGR)																			
291			4TH PLT (ASLT/OB)																			
292		D CO (ENGR ASLT)																				
293			HQ SEC																			
294			ASLT & BARRIER SEC																			
295			MAINT SEC																			
296			1ST PLT (ENGR)																			
297			2ND PLT (ENGR)																			
298			3RD PLT (ENGR)																			
299																						
300		19TH ENGR SUB-TOTAL				37		15	16	12	4		30	1	32	13		30	3	5	27	225
301		SIM				2									1							3
302		UNASSIGNED				11																11
303		SAF				6			4									6				16
304		BBS/JANUS				18		15	12	12	4		30	1	31	13		24	3	5	27	195
305																						
306																						TOT
307		75TH SPT BN																				
308		HHD																				
309			BN HQ																			
310				COMMO SEC																		
311				S-1																		
312				S-2/3																		
313				SPT OP SEC																		
314				S-4																		
315			HQ DET																			
316		SUPPLY & TRANS CO													2							2
317			HQ																			
318			AMMO TRANSFER																			
319			SUPPLY PLT																			
320																						
321																						
322																						
323																						
324		MAINT CO													2							2
325			HQ																			
326				MAINT CONT T																		
327				RECOVERY SE																		
328				STORE DX																		
329				ARMAMENT PL																		

F	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
330				GROUND SPT																		
331				TANK SYS SPT TM																		
332				TANK SYS SPT TM																		
333				INF MECH SPT TM																		
334			MEDICAL CO												4							4
335				HQ																		
336				AMBL PLT																		
337				TREATMENT PLT																		
338				HOLDING PLT																		
339				PREV MED SEC																		
340																						
341	75TH SPT BN					14					3		22	15	144	75			2	11		286
342			SIM												8							8
343			UNASSIGNED																			
344			SAF																			
345			BBS/JANUS			14					3		22	15	136	75			2	11		278
346																						
347																						
348	194TH BDE TOTAL					193	82	15	16	12	53	36	117	16	320	198	12	97	25	20	85	1302
349			SIM			31	62				4		4		27			23				151
350			UNASSIGNED			34																34
351			SAF			10			4		21	8	20	1	5		6	6	8			89
352			BBS/JANUS			123	20	15	12	12	28	28	93	15	288	198	6	68	17	20	85	1028

G	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	SIMULATOR REQUIREMENTS ANALYSIS FOR PROJECTED 194TH BDE																					
2	TF (MECH HV) SLICE IN THE DEFENSE, AS OF 3 JAN 94																					
3																						
4																						
5	HHC, D/10, TF2-33, TF2-136, 1-201 FA, A/77FA,19EN, 75TH SPT																					
6																						
7																						
8																						
9				BASELINE TOE																		
10																						
11																						
12						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-TLIF		LT-T	ME-T	MOR	TAN	VTR	WREDI		TOT
13	BDE HHC																					
14			MP PLT												6							6
15			HQ SEC			1																1
16			S-1																			
17			S-2																			
18			S-3			1																1
19			S-4																			
20			MAINT SEC																			
21			COMMO SEC																			
22																						
23	HHC SUB-TOTAL					7									18	3			1			29
24																						
25			SIMS			2									6							8
26			UNASSIGNED																			
27			SAF																			
28			BBS/JANUS			5									12	3			1			21
29																						
30																						
31						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-TLIF		LT-T	ME-T	MOR	TAN	VTR	WREDI		TOT
32	TF 2-33																					
33			HHC, 2-33																			
34				CMD SEC																		
35				S-1																		
36				S-2																		
37				S-3																		
38				S-4																		
39				HQ SEC																		
40				COMMO SEC																		
41				SCOUT PLT																		
42				MORTAR PLT																		
43				SUPPORT PLT																		
44				MESS SEC																		
45				MEDICAL PLT																		
46				MAINT LT																		
47					SUPPLY SEC																	
48					RECOVERY SEC																	
49					MAINT SEC																	
50					CO A TEAM																	

				CO B TEAM																		
				CO C TEAM																		
				CO D TEAM																		
			UNIT MINISTRY																			
		CO A (TANK)																				
			HQ SEC																			
			1ST PLT																			
			2ND PLT																			
			3RD PLT																			
		CO B (TANK)																				
			HQ SEC																			
			1ST PLT																			
			2ND PLT																			
			3RD PLT																			
		CO C (TANK)																				
			HQ SEC																			
			1ST PLT																			
			2ND PLT																			
			3RD PLT																			
		CO D (MECH)																				
			HQ SEC																			
			1ST PLT (RIFLE)																			
			2ND PLT (RIFLE)																			
			3RD PLT (RIFLE)																			
			4TH PLT (AT)																			
TF 2-33 SUB-TOTAL					27	20				17		16		25	33	6	44	7	2	10	207	
		SIM																				
		UNASSIGNED																				
		SAF																				
		BBS/JANUS			27	20				17		16		25	33	6	44	7	2	10	207	
					APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT	
TF 2-136																						
		HHC																				
			CMD SEC			1															1	
			S-1																			
			S-2																			
			S-3			1															1	
			S-4																			
			HQ SEC											1							1	
			COMMO SEC																			
			SCOUT PLT		6																6	
			MORTAR PLT		2																2	
			SPT PLT							4		4									8	
			MESS																			
			MED PLT																			
			MAINT PLT											1							1	
				SUPPLY SEC																		
				RECOVERY SEC																		
				MAINT SEC																		
				CO A TEAM	1																1	
				CO B TEAM	1																1	
				CO C TEAM	1																1	
				CO D TEAM	1																1	
			UNIT MINISTRY																			
		CO A (TANK)																				
			HQ SEC											1			2				3	
			1ST PLT														4				4	
			2ND PLT														4				4	
			3RD PLT														4				4	
		CO B (MECH)																				
			HQ SEC			2								1						1	4	
			1ST PLT (RIFLE)			4														3	7	
			2ND PLT (RIFLE)			4														3	7	
			3RD PLT (RIFLE)			4														3	7	
			4TH PLT (AT)		5																5	
		CO C (MECH)																				
			HQ SEC			2								1						1	4	
			1ST PLT (RIFLE)			4														3	7	
			2ND PLT (RIFLE)			4														3	7	
			3RD PLT (RIFLE)			4														3	7	
			4TH PLT (AA)		5																5	
		CO D(MECH)																				
			HQ SEC			2								1						1	4	

G	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
126			1ST PLT (RIFLE)				4														3	7
127			2ND PLT (RIFLE)				4														3	7
128			3RD PLT (RIFLE)				4														3	7
129			4TH PLT (AT)			5																5
130	TF 2-136 SUB-TOTAL					39	50				17		16		24	35	6	14	7	2	30	240
131		SIM				27	44				4		4		6			14			30	129
132		UNASSIGNED				8																8
133		SAF				4	6				13		12				6		7			48
134		BBS/JANUS													18	35				2		55
135																						
136																						
137						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
138	D-10 CAV TROOP																					
139			HQ SEC															1				1
140			1ST PLT (TANK)															1				1
141			2ND PLT (TANK)															1				1
142			3RD PLT (SCOUT)				1														1	2
143			4TH PLT (SCOUT)				1														1	2
144																						
145	D-10 CAV SUB-TOTAL						12				3				3	1		9			12	40
146		SIM					2											3			2	7
147		UNASSIGNED																				
148		SAF									3											3
149		BBS/JANUS					10								3	1		6			10	30
150																						
151						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
152	COMBAT SUPPORT																					
153																						
154		ADA PLT													1							1
155																						
156		CHEMICAL PLT																				
157			RECON SEC																			
158			SMOKE SEC																			
159																						
160		MI COMPANY																			6	6
161																						
162	CS SUB-TOTAL					6									22	11					6	45
163		SIMS													1						6	7
164		UNASSIGNED													5							5
165		SAF																				
166		BBS/JANUS				6									16	11						33
167																						
168						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
169	1-201 FA BN																					
170		HHB																				
171			HQ SEC																			
172			S-1																			
173			S-2																			
174			S-3																			
175			S-4																			
176			FIST SEC			5																5
177			COLT SEC			1																1
178			MESS																			
179			MAINT																			
180			MED SEC																			
181			COMMO PLT																			
182			METROLOGICAL SE																			
183			RECON SEC																			
184		A BATTERY																				
185			HQ SEC																			
186			DETAIL SEC																			
187			AMMO PLT																			
188			MAINT SEC																			
189			SURVEY SEC																			
190			COMMO SEC																			
191			1ST PLT																			
192				HQ																		
193				FDC																		
194				HOW																		
195			2ND PLT																			
196				HQ																		
197				FDC																		
198				HOW																		
199		B BATTERY																				
200			HQ SEC																			

			DETAIL SEC																			
			AMMO PLT																			
			MAINT SEC																			
			SURVEY SEC																			
			COMMO SEC																			
			1ST PLT																			
				HQ																		
				FDC																		
				HOW																		
			2ND PLT																			
				HQ																		
				FDC																		
				HOW																		
		C BATTERY																				
			HQ SEC																			
			DETAIL SEC																			
			AMMO PLT																			
			MAINT SEC																			
			SURVEY SEC																			
			COMMO SEC																			
			1ST PLT																			
				HQ																		
				FDC																		
				HOW																		
			2ND PLT																			
				HQ																		
				FDC																		
				HOW																		
				HOW																		
		A/77 BATTERY																				
			HQ SEC													1						1
			DETAIL SEC																			
			AMMO PLT																			
			MAINT SEC																			
			SURVEY SEC																			
			COMMO SEC																			
			1ST PLT																			
				HQ												1						1
				FDC																		
				HOW																		
			2ND PLT																			
				HQ												1						1
				FDC																		
				HOW																		
ARTY BN SUB-TOTAL					68					9	36	33		52	27			5			230	
	SIM				6									3							9	
	UNASSIGNED				12																12	
	SAF									5	8	8	1					1			23	
	BBS/JANUS				50					4	28	25	-1	49	27			4			186	
																					TOT	
19TH ENGR BN																						
	HHC																					
		HQ SEC																				
		S-1																				
		S-2																				
		S-3																				
		S-4																				
			MAINT PLT																			
			SPT PLT																			
		COMMO SEC																				
		MESS																				
	A CO																					
		HQ SEC														1						1
		SP PLT																				
			PLT HQ																			
			EQUIP SEC																			
			MAINT SEC																			
		1ST PLT (ENGR)			1																	1
		2ND PLT (ENGR)			1																	1
		4TH PLT (ASLT/OB)																				
	B CO																					
		HQ SEC																				

G	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
276			SP PLT																			
277				PLT HQ																		
278				EQUIP SEC																		
279				MAINT SEC																		
280			1ST PLT (ENGR)																			
281			2ND PLT (ENGR)																			
282			4TH PLT (ASLT/OB)																			
283		C CO																				
284			HQ SEC																			
285			SP PLT																			
286				PLT HQ																		
287				EQUIP SEC																		
288				MAINT SEC																		
289			1ST PLT (ENGR)																			
290			2ND PLT (ENGR)																			
291			4TH PLT (ASLT/OB)																			
292		D CO (ENGR ASLT)																				
293			HQ SEC																			
294			ASLT & BARRIER SEC																			
295			MAINT SEC																			
296			1ST PLT (ENGR)																			
297			2ND PLT (ENGR)																			
298			3RD PLT (ENGR)																			
299																						
300	19TH ENGR SUB-TOTAL					37		15	16	12	4		30	1	32	13		30	3	5	27	225
301		SIM				2									1							3
302		UNASSIGNED				11																11
303		SAF				6			4									6				16
304		BBS/JANUS				18		15	12	12	4		30	1	31	13		24	3	5	27	195
305																						
306						APC	BFV	DOZ	DUM	EVA	FUE	HOW	HV-T	LIF	LT-T	ME-T	MOR	TAN	VTR	WRE	DI	TOT
307	75TH SPT BN																					
308		HHD																				
309			BN HQ																			
310				COMMO SEC																		
311				S-1																		
312				S-2/3																		
313				SPT OP SEC																		
314				S-4																		
315			HQ DET																			
316		SUPPLY & TRANS CO													2							2
317			HQ																			
318			AMMO TRANSFER																			
319			SUPPLY PLT																			
320																						
321																						
322																						
323																						
324		MAINT CO													2							2
325			HQ																			
326				MAINT CONT T																		
327				RECOVERY SE																		
328				STORE DX																		
329				ARMAMENT PL																		
330				GROUND SPT																		
331			TANK SYS SPT TM																			
332			TANK SYS SPT TM																			
333			INF MECH SPT TM																			
334		MEDICAL CO													4							4
335			HQ																			
336			AMBL PLT																			
337			TREATMENT PLT																			
338			HOLDING PLT																			
339			PREV MED SEC																			
340																						
341	75TH SPT BN					14					3		22	15	144	75			2	11		286
342		SIM													8							8
343		UNASSIGNED																				
344		SAF																				
345		BBS/JANUS				14					3		22	15	136	75			2	11		278
346																						
347																						
348	194TH BDE TOTAL					198	82	15	16	12	53	36	117	16	320	198	12	97	25	20	86	1302
349		SIM				37	46				4		4		25			17			38	171
350		UNASSIGNED				31									5							36

ACRONYMS

A2ATD	Anti-Armor Advanced Technology Demonstration
AA	Assembly Area
AAR	After Action Review
AC	Active Component
ACE	Bulldozer
ADST	Army Program using GT 200
AIU	Automated Interface Unit
APC	Armored Personnel Carrier
ARM	Armor
ARNG	Army Reserve and National Guard
ARPA	Advanced Research Projects Agency
ARSI	ARPA Reconfigurable Simulator Initiative
ASAP	As soon as possible
AT	Anti-Tank
ATD-1	Advanced Technology Demonstration #1
ATK	Attack
AVLB	Armored Vehicle Launched Bridge
BBS	Battalion/Brigade Battle Simulation
BDE	Brigade
BFV	Bradley Fight Vehicle
BN	Battalion
C&C	Command and Control
CAD/CAM	Computer-Aided Design/Computer-Aided Manufacturing
CATT	Combined Arms Tactical Trainer
CB	Citizen Band
CBT	Combat
CCTT	Close Combat Tactical Trainer
CD	Combat Development
CEV	Combat Engineer Vehicle
CFX	Command Field Exercise
CIG	Computer Image Generator
CLS	Contractor Logistics Support
CMD SEC	Command Section
CO	Company
COFT	Conduct of Fire Trainer
COMMO SEC	Communications Security
CS	Combat Support
CSS	Combat Service Support
CSS/TSS	Combat Service Support/Training Support Simulation
DEF	Defense
DI	Dismounted Infantry
DIV	Division
DMA	Defense Mapping Agency
DMD	Digital Message Device
DOZER	Bulldozer
DUMP	Dump truck
EVAC	Evacuator
FDC	Fire Direction Center
FED	Forward Entry Devices
FIST	Fire Support Team Vehicle
FLOT	Forward Line of Own Troops
FO	Forward Observer
FSB	Forward Support Base
FTX	Field Training Exercise
FUEL	Fuel truck
FY	Fiscal Year
GUARDFIST	Guard Unit Armory Device - Full Crew Simulation Trainer
H/W	Hardware
HHC	Headquarters and Headquarters Company
HMMWC	High Mobility Multi-purpose Wheeled Vehicle
HOW	Howitzer
HQ SEC	Headquarters Section
HV-T	Heavy truck
IDA	Institute for Defense Analyses
IEW	Intelligence and Electronic Warfare
INF	Infantry
ITV	Improved TOW Vehicle

IVIS	Intervehicular Information System
LIFT	Fork lift truck
LT-T	Light truck
MAINT	Maintenance
MAX	Maximum
MCC	Management Control Center
MECH	Mechanical
MED	Medical
MED-T	Medium truck
METL	Mission Essential Task List
MOB/CM	Mobility/Countermobility
MORT	Mortar
MTC	Movement to Contact
MWTB	Mounted Warfare Test Bed
ModSAF	Modular Semi-Automated Forces
NG	National Guard
NRaD	Naval Command, Control, and Ocean Surveillance Center; Research, Development, Test and Evaluation Division
NTC	National Training Center
PAT	Program Action Team
PC	Personal Computer
PGS	Precision Gunnery System
PGT	Platoon Gunnery Trainer
PLT	Platoon
PSS	Personnel Service Support
QLT	Quick Look Team
RC	Reserve Component
RCVTP	Reserve Component Virtual Training Program
S&T	Supply and Transportation
S-1	Staff Personnel Officer
S-4	Staff Logistics Officer
S/W	Software
SAF	Semi-Automated Forces
SAFDI	Semi-Automated Forces Dismounted Infantry
SIM	Simulators
SIMNET	Simulation Networking
SOP	Standard Operating Procedure
SPT	Support
STOW	Synthetic Theater of War
TADSS	Training Aids, Devices, Simulators and Simulations
TANK	Tank-like vehicle
TARDEC	Tank and Automotive Research, Design and Experiment Command
TF	(Battalion) Task Force
TO&E	Table of Organization and Equipment
TOC	Tactical Operations Center
TOW	Tubed launched, optically tracked wire guided
TRA	Training Requirements Analysis
TRADOC	Training and Doctrine Command
TTP	Tactics, Techniques, and Procedures
TWGSS	Tank Weapons Gunnery Simulation System
U.S.	United States
UCF	University of Central Florida
VB	Virtual Brigade
VBTP	Virtual Brigade Training Program
VSF	Vetronics Simulation Facility
VTR	Tracked Recovery Vehicle
VTX	Virtural Training Exercise
Wrecker	Wheeled Recovery Vehicle

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6. AUTHOR(S)
Larry Mengel, Don Appler, Arthur Junot, Julia A. Loughran, D. Robert Worley

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Institute for Defense Analyses (IDA)
1801 N. Beauregard St.
Alexandria, VA 22311-1772

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In November 1993, ARPA tasked IDA to conduct a quick analysis of the functional requirements for the Army's Virtual Brigade Training Program (VBTP). Two key factors dictated the urgency of this effort: (1) the expiration of a low cost option to buy computer image generators (CIGs) from the Close Combat Tactical Trainer (CCTT) contractor was imminent; and (2) the brigade was scheduled for its National Training Center (NTC) rotation in May 1996. Both ARPA and the Army needed a better understanding of VBTP requirements. In response, IDA established the Quick Look Team (QLT) to work concurrently and in cooperation with the Ft. Knox Program Action Teams (PATs) which have the mission of determining the functional requirements for the VBTP. The QLT recommendations were preliminary inputs to the Ft. Knox PATs. The QLT recommendations included immediate contracting for the doubling of the simulation facility's physical plant, and the construction of a low-cost-per-seat, reconfigurable simulator called a *pod*.

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